BULLETIN OF MISCELLANEOUS INFORMATION No. 4 1931
ROYAL BOTANIC GARDENS, KEW

XXV.—THE FLORA OF THE LIBYAN DESERT.

An account of the recent expedition into the Libyan Desert under Major R. A. Bagnold was published in "The Times" of January 3rd and 4th last. The expedition went in a general line due south-west from Cairo for some 350 miles to the Oasis of Ain Dalla. Thence the region of high sand dunes to the south-west was entered.

Mr. W. B. K. Shaw, lately of the Anglo-Egyptian Sudan Forest Service, who already had experience of the Libyan Desert, accompanied the party, and to him we are indebted for the specimens which he collected and for information about the vegetation of this little-known part of Africa.

In a letter dated the 10th November last, written on the return journey, at the Kharga Oasis, Mr. Shaw states that the great distances covered, the use of motor cars instead of camels, and the very limited amount of baggage which could be carried, afforded little opportunity for collecting specimens.

His observations on the vegetation are as follows.

" We accomplished our round trip Cairo-Baharia-Owenat-Selima-Halfa-Kharga and covered a lot of new ground.

" I found Shabatai's name* in the Rest House at Baharia and so did not do any botanizing there.

" Between Baharia and Ain Iddaila I collected *Salsola tetrandra* Forsk.† and *Cleome arabica* Linn. where the bare limestone rock collects water from an occasional rain.

" At Ain Iddaila, a very small water point, hardly an oasis, were a few date palms and *Phragmites communis* Trin., *Salix Safsaf* Forsk., *Tamarix mannifera* Ehrenb., and *Alhagi Maurorum* Medic.

" From Ain Iddaila we entered the unknown sand-sea to the west, and here the only species I saw was *Ephedra alata* var. *Decaisnei* Stapf, usually as single isolated plants in pure sand. While in this region we struck the Kufra—Abu Mongar camel route and for some hundreds of yards in several places it was clearly marked by the shrivelled remains of plants. They were not worth collecting, but I think they must have been ' nissa ' or ' gau ' (?*Aristida* sp.). It was an interesting find ; there appear two possible explanations. Either the seeds fell in the camel dung and germinated, though I think this unlikely because from what I can remember these plants

*Mr. Yusef Shabatai of the Egyptian Ministry of Agriculture.

†Mr. Shaw refers to his specimens by their Field Numbers. The identifications have now been completed, and the names are here substituted.

are too small to be worth collecting for camel fodder, and also because camels on this route would most probably be fed on dates—we found old camel dung with date stones embedded in the centre; or the moving of the surface sand by the camels' feet created a ' mulch ' which enabled the existing seeds to take the most advantage of an occasional shower, or dew. In the Sudan one could always see the trees and grass greener along the edges of sandy tracks than a few yards away from them.

" From here on to Owenat I saw no vegetation save for an occasional withered plant of the aforesaid ' nissa,' in fact virtually nothing.

" Our activities at Owenat were curtailed and so we were unable to explore round the mountain.

" The vegetation is confined to the ' kaihuis ' or ' wadis ' which are eroded back into the mountain mass and run out a little way to the surrounding plain. There had been no rain at Owenat this year, so the existing vegetation was not in a very luxuriant state. We only met with one man there, a rather miserable Bornawi slave who knew very little Arabic. He said the only trees were Talh and Seyal, and this was all I saw, . . . I did see one other tree about 3000 ft. up on the great central cliff, when trying to reach the summit. It reminded me of *Maerua rigida* (?) of the Sudan ; I took a specimen but by the time I got back to camp all the brittle leaves had fallen off.

" Apart from the trees, *Pulicaria crispa* Bth. & Hook. f., *Cleome droserifolia* Del., *Panicum turgidum* Forsk., *Pergularia tomentosa* Linn., *Aerva tomentosa* var. *Bovei* C. B. Cl. and *Heliotropium undulatum* Vahl. (which smelt like mint) were all I saw at Owenat, *Panicum turgidum* Forsk. by far the most common. I think *Fagonia Bruguieri* DC. was also there. There was only xerophytic vegetation.

Yours, etc.,

W. B. K. SHAW."

Under cover of a subsequent letter Mr. Shaw sent a piece of wood from " a dead, leafless, low plant 3 to 4 feet high, found in the heart of the sand-sea to the West of Ain Iddaila." This has proved to be a specimen of *Ephedra*, probably *E. Alte* or *E. altissima*.

Thanks to the information and specimens Mr. Shaw has kindly supplied, we are in a position now to know that the flora of the area traversed belongs to the Floral Province of the Sahara, of Engler's North African and Indian Desert Region. We are also now in a position to state that the whole of this country falls within the Biological Region of Africa and is the outer fringe of many types found in the West African Botanical Region.

The following is a list of the plants collected by Mr. Shaw, with notes on their distribution by Mr. J. Hutchinson.

Gnetaceae.

Ephedra alata, var. **Decaisnei** *Stapf* Die Arten der Gattung Ephedra 37 (1889) ; Muschler Fl. Egypt 1 : 8.

Sand-desert west of Ain Iddaila, about 600 ft., woody shrublet 18 ins. high, No. 7.

Distrib.—From the Libyan desert to Sinai.

Capparidaceae.

Cleome droserifolia *Del.* Fl. Egypt. 317, t. 36, fig. 2 ; Oliv. Fl. Trop. Afr. 1 : 77.

Owenat : high up Karkui Talh ; aromatic herb 18 in. high, No. 11.

Distrib.—Extends through the Sinai Peninsula to Southern Syria and to Muskat in Arabia. According to Ascherson and Schweinfurth this species also occurs in Nubia and Abyssinia. I have not seen specimens from either of these countries. Their record for Abyssinia was probably based on Salt's specimen, which may not have been collected in Abyssinia, for Salt quotes Forskål, Fl. Aegypt.-Arab. p. 35, where the species is recorded only from Suez.

This species is a very striking one and belongs to a small and very advanced group of the genus characterised by simple orbicular leaves and usually only four stamens. This group occurs only from the Egyptian Sudan through Arabia to Western India, and it is a very distinct desert type, quite different from the remainder of the genus as represented in Tropical Africa generally.

Cleome arabica *Linn.* Cent. Plant. 1 : 20 (1755) ; Oliv. Fl. Trop. Afr. 1 : 77.

In small drainage lines on rugged limestone plateau between Baharia and Ain Iddaila, about 600 ft., No. 2.

Distrib.—A weedy type widely spread from Algeria through North Africa to Eastern Sudan, Abyssinia and Arabia. It has a disagreeable smell.

Cruciferae.

Morettia Philaeana *DC.* Syst. 2 : 427 (1821) ; Oliv. Fl. Trop. Afr. 1 : 61 ; Boiss. Fl. Or. 1 : 145.

Near Gebel Kissu, 20 miles south of Owenat, about 1500 ft., No. 17.

Distrib.—Northern part of Eastern Sudan, Nubia and Egypt. The Sinai and Palestine records by Muschler (Fl. Egypt 1 : 403) probably refer to *N. parviflora* Boiss. Boissier's *M. asperrima* from Muscat is no doubt a distinct species.

Morettia is a small desert genus of three species distributed from Algeria and the Central Sahara to the Eastern Coast of Arabia.

Chenopodiaceae.

Salsola tetrandra *Forsk.* Fl. Aegypt.-Arab. 58 (1775).—*Salsola tetragona* Del.—Boiss. Fl. Or. 4 : 946.

Between Baharia and Ain Iddaila, in small drainage lines on rugged limestone plateau, low herb 1–2 ft. high, No. 1.

Distrib.—Desert regions through North Africa from Tunis to Palestine.

Cornulaca monacantha *Del.* Fl. Egypt. 234, t. 22 (1813) ; Boiss. Fl. Or. 4 : 984 ; Muschler Fl. Egypt 1 : 302.

In sand, approx. lat. 27°, long. 27° 10′, 500 ft., low prickly herb 18 in. high, No. 9.

Distrib.—From Mauritania through the Algerian and Central Sahara through Egypt to Afghanistan.

Haloxylon Schweinfurthii *Aschers.* in Aschers. & Schweinf. Ill. Fl. Egypt 128, No. 903 (1887) ; Muschler Fl. Egypt 1 : 294.

In scattered clumps on limestone, approx. lat. 26° 10′, long. 27° 10′, about 900 ft., low bush 2 ft. high, No. 8. Vernacular name *Dumran*.

Distrib.—Endemic to Egypt.

Amarantaceae.

Aerva tomentosa var. **Bovei** *C. B. Clarke* in Dyer, Fl. Trop. Afr. 6, 1 : 38.

In drainage line on plain near south foot of Gebel Owenat, about 1500 ft., bushy herb 3 ft. high, No. 16.

Distrib.—Central Sahara to Nubia and Kordofan.

Zygophyllaceae.

Fagonia Bruguieri *DC.* Prodr. 1 : 704 (1824).—*F. echinella* Boiss. *F. diversifolia* Boiss. *F. myriacantha* Boiss. *F. cretica* Oliv. Fl. Trop. Afr. 1 : 287, partly, not of Linn.

In drainage lines, approx. lat. 21° 30′, long. 26° 30′, about 1400 ft., low prickly herb 12 ins. high, No. 20.

Distrib.—Widely spread in desert areas from Algeria and the Central Sahara to Western India ; in Tropical Africa extending to Somaliland.

Tamaricaceae.

Tamarix mannifera *Ehrenb.* ex *Bunge* Tentam. Gen. Tamar. 60 (1852) ; Boiss. Fl. Or. 1 : 775 ; Muschler Fl. Egypt 1 : 648.

Ain Iddaila, near the well, about 300 ft., low tree or bush on sand-mounds, No. 5.

Distrib.—Libyan Desert through Egypt to Persia and Arabia, Nubia and the island of Socotra.

Mimosaceae.

Acacia flava *Schweinf.* in Bull. Herb. Boiss. 4, App. 2 : 214 (1896). —*Mimosa flava* Forsk. Fl. Aegypt.-Arab. 176 (1775). *A. Ehrenbergiana* Hayne Arzeneigew. 10 : t. 29 ; Schweinf. in Linnaea 35 : 352, tt. 15, 16.

Owenat, 2000 ft., low tree up to 20 ft., No. 15. Vernacular name ? *Seyal*.

Distrib.—Occurs, according to Schweinfurth, from Nubia to Arabia.

Acacia tortilis *Hayne* Arzeneigew. 10 : t. 31 (1827).

Owenat, at foot of cliff, tree 25 ft. high, 2000-4000 ft., Nos. 14, 19. Vernacular name *Talh.*

Distrib.—In the dry parts of West Africa from Senegambia to N. Nigeria ; Egypt to Palestine.

Note.—A useful key to the *Acacia* species of the Nile Region is given by Schweinfurth in Linnaea 35 : 318.

Papilionaceae.

Alhagi Maurorum *Medic.* in Vorles. Churpf. Phys. Ges. 22 : 397 (1787) ; Desv. Journ. 1 : 120, t. 4 (1813) ; Boiss. Fl. Or. 2 : 558 ; Oliv. Fl. Trop. Afr. 2 : 142 ; Muschler Fl. Egypt 1 : 536.

Ain Iddaila, about 330 ft., No. 6. Vernacular name *Agul.*

Distrib.—A desert type. Widely spread from North Africa through Cyprus, Asia Minor, and Egypt to Afghanistan. Occurs also in Nubia, just within the tropics.

Salicaceae.

Salix Safsaf *Forsk.* Fl. Aegypt.-Arab. lxxvi (1775) ; Boiss. Fl. Or. 5 : 1183 ; Skan in Dyer Fl. Trop. Afr. 6, 2 : 318.

Near Ain Iddaila well, about 300 ft., low bush 6 ft. high, No. 4.

Distrib.—Widely spread in Tropical Africa, extending through Egypt to Syria and Palestine.

Asclepiadaceae.

Pergularia tomentosa *Linn.* Mant. 1 : 53 (1767) ; Hutch. & Dalz. Fl. West Trop. Afr. 2 : 55. *Daemia tomentosa* Vatke—Muschl. Fl. Egypt 2 : 745. *D. cordata* R. Br.—N. E. Brown in Dyer Fl. Trop. Afr. 4, 1 : 386.

Owenat, about 3000 ft., shrub 2 ft. high, with milky juice, No. 13.

Distrib.—Widely distributed in North Africa from the Atlantic sea-board to Northern Nigeria and the Eastern Sudan to Syria and as far as Beluchistan.

Compositae.

Pulicaria crispa *Benth. & Hook. f.* Gen. Pl. 2 : 336 (1873) ; Oliv. & Hiern Fl. Trop. Afr. 3 : 366 ; Boiss. Fl. Or. 3 : 206.

Owenat, high up Karkan Talh, 3000 ft., low herb 1 ft. high, No. 10.

Common from Senegal to Northern Nigeria and to the Eastern Sudan ; extends through Arabia and the near east generally to India.—Mostly well protected by woolly hairs.

Boraginaceae.

Heliotropium undulatum *Vahl.* Symb. 1 : 13 (1790) : Boiss. Fl. Or. 4 : 147 ; Baker & Wright in Dyer Fl. Trop. Afr. 4, 2 : 37.

Owenat, on cliff top, about 4000 ft., low plant 8 ins. high, No. 18.

Distrib.—Widely spread from the Cape Verde Islands through North Africa to Palestine and Arabia and in Tropical Asia.

Aristida acutiflora *Trin. & Rupr.* in Mém. Acad. Petersb. ser. 6, 5 : 167 (1842) ; Boiss. Fl. Or. 5 : 497 ; Muschler Fl. Egypt 1 : 79 ; Henrard Monogr. Aristida 1 : 64 (1929).

In clumps in drainage lines, approx. lat. 21° 30′, long. 26° 30′, about 1400 ft., No. 21.

Distrib.—Western Sahara to Egypt and Nubia.

Aristida pungens *Desf.* Fl. Atlant. 1 : 109, t. 35 (1798) ; Boiss. Fl. Or. 5 : 498 ; Muschler Fl. Egypt 1 : 80 ; Henrard Monogr. Aristida 1 : 57 (1929).

Dibbis, grass on low sandy mounds, No. 22.

Distrib.—From Tunis to Egypt and Nubia. According to Muschler this grass is common in Egyptian cotton fields.

Panicum turgidum *Forsk.* Fl. Aegypt.-Arab. 18 (1775) ; Stapf in Fl. Trop. Afr. 9 : 706 ; Muschler Fl. Egypt 1 : 57.

Owenat, 2000-3000 ft., 2 ft. high in clumps, the most frequent plant in the Wadis, No. 12.

Distrib.—From Senegal eastwards to Palestine and Sind.

Phragmites communis *Trin.* Fund. Agrost. 134 (1820) ; Boiss. Fl. Or. 5 : 563.

Near Ain Iddaila well, about 300 ft., tall reed 6 ft. high, No. 3.

Distrib.—Widely spread nearly all over the world.

XXVI.—THE NATIONAL PINETUM AT BEDGEBURY.

W. Dallimore.

The First Quinquennial Review.

Increasingly unsatisfactory atmospheric conditions at Kew, together with natural soil that is not very suitable for certain genera of coniferous trees, proved, after a long trial, that the attempt to cultivate a full collection of hardy conifers in the Royal Botanic Gardens, Kew, must sooner or later be abandoned. With this in mind an arrangement was made whereby Kew and the Forestry Commission should become jointly responsible for the formation of a new National Pinetum on Forestry Commission land at Bedgebury in Kent, where numerous well-grown conifers, forty-five years old and upwards, already existed (*K.B.* 1924, p. 113 : 1925, p. 293).

In view of the difficulties created in the past through lack of historical data connected with many famous collections of trees, the Committee responsible for the undertaking made provision for recording planting operations, the enumeration of plants, and a quinquennial review of the Pinetum and its contents. To aid in this a planting book has been kept in which all the trees are entered with species index numbers from 1 upwards, whilst the individual plants of a species are given a letter from A onwards :—e.g. *Abies Lowiana* 3. A : 3. B : 3. C : 3. D : 3. E : 3. F. Varieties are further separated by means of other signs as *Abies Lowiana* var.

glauca 3. × A : 3. × B : 3. × C. As these indicatory signs are given on the permanent labels attached to the plants it is possible with little trouble to keep a definite record of each individual.

A number of plants were sent from Kew to the Forestry Commission's nursery for the new Pinetum in 1924, but it was in March 1925 that planting was begun ; the first quinquennial period, therefore, closed in 1930. In order to bring later planted trees into line with those planted in 1925 for the review in 1935, all plants were remeasured at the end of the 1930 growing period. Thus, whilst some plants had had six growing seasons at Bedgebury, others had had only five, four, three, two or one. The majority, however, were planted in February 1926.

Where a large collection of trees from all the temperate parts of the world is assembled, there are bound to be some that do not thrive so well as others, and the collection at Bedgebury is no exception. The general condition of the trees, however, justifies optimistic opinions for the future of the undertaking. In some instances extraordinary growth has been made, and the trees have an appearance of rude health. In other cases growth has not reached expectations, but even in such instances it is comforting to find that root action has been particularly vigorous, even though branch development has been slow.

The five years 1925-30 were not particularly favourable to tree growth, and the more or less expected cultural difficulties incidental to the establishment of a large collection of trees have been present.

During the springs of 1926, 1927 and 1928 there were severe frosts which seriously injured the earlier-growing species, more particularly *Abies* and *Picea*. Some did not recover ; others, due to an excellent root system, have formed strong new leading shoots from adventitious stem buds. As the small plants have been found to suffer from spring frosts much more severely than taller ones, it is hoped that as height increases so danger from late spring frosts will gradually disappear. Unusually severe weather was experienced during the winter of 1928-1929, which resulted in the death of a number of more or less tender species, some of which had passed through one, two or three winters with little injury. The growing seasons of 1929 and 1930 were favourable and little harm was caused by spring frost.

Insect pests have been troublesome throughout the five years the Pinetum has been in existence. Pine Weevils and Pine Beetles, in the earlier days, caused a good deal of injury amongst young pine trees, but constant trapping had the desired effect and no damage from these pests has been noticed during the last two years. A little injury is being caused by the Pine-Shoot Tortrix Moth and the Pine Sawfly, but hand-picking has kept them from making progress. The presence of Green Spruce Aphis on several species of *Picea*, and *Dreyfusia* on certain species of *Abies*, is a more serious problem, for the pests are abundant on large trees in the vicinity, and as fast as

young trees are cleaned by spraying, insects appear again from surrounding trees. The Piceas most susceptible to attack are *P. alba, P. sitchensis, P. pungens,* and *P. Engelmanni,* and throughout the growing season it is necessary to spray them at least once a fortnight. In January of the present year the Green Spruce Aphis was active and breeding. The Larch Shoot Moth (*Argyresthia laevigatella*) is present on the larches, but it is not doing much harm. Larch Aphis is present but not troublesome, and two or three other insect pests have been noted, but they have done little harm.

Fungus diseases have caused the death of a number of trees. Of these the Honey Fungus (*Armillaria mellea*) has taken the highest toll. As there are so many dead stumps of trees about the ground losses from this disease must be expected. It is curious, however, to note that whereas in certain species and varieties only odd trees have been killed from amongst others of the same kind, five plants of *Cupressus Lawsoniana* var. *Pottensii* that had grown exceptionally well have already been killed by this disease, whilst other varieties of *Cupressus Lawsoniana* near by have so far been unaffected. Weymouth Pine Rust (*Cronartium ribicolum*) has been noted amongst the five-leaved pines, and affected trees of *Pinus Strobus, P. excelsa* and *P. Armandii* have been destroyed in an endeavour to prevent the spread of the disease. Although Larch Canker Fungus is prevalent in a plantation a short distance from the collection of Larches, the young trees are quite free from the fungus, doubtless by reason of wide spacing and well-worked ground. The diseased appearance of some of the branches of the more tender species of *Cupressus* caused some alarm, but on microscopic examination it was found to be the result of frost bite ; it is hoped that as the trees increase in age and height they may be less subject to this injury.

An item of considerable interest in the Pinetum is the natural regeneration that is in progress. In some parts young Scots Pine have been numerous enough to form a well-stocked forest. Other naturally-regenerated trees are Lawson Cypress, Douglas Fir, Sitka Spruce, *Thuja plicata, Tsuga albertiana,* and *Abies grandis,* in addition to common trees such as Holly, Oak, Sweet Chestnut, etc. Amongst the Scots Pines a good deal of difference is noticeable in length, width, and shape of leaf.

The violent winds experienced during the autumns of 1928 and 1929 blew down between 30 and 40 old specimens of *Pinus sylvestris, Abies grandis, Cupressus thyoides, C. Lawsoniana, Thuja plicata, Pinus Banksiana* and other trees. Many of these were between 70 and 90 feet high and 50 or 60 years old. Most of the trees blown down were in places where the water table was within 12 or 15 inches of the surface and the trees were very shallowly rooted.

Whilst it is not possible to refer to the whole of the trees in the collection, the following list, which is a fair sample, gives some interesting measurements. (The indicatory letters refer to the individual plant cited.)

		Height at planting time (1925)		Present height (1930)	
		ft.	ins.	ft.	ins.
Abies lasiocarpa var. arizonica ...	A	2	3	5	6
,, ,, ,, ,, ...	B	2	1	6	3
,, ,, ,, ,, ...	C	2	4	5	3
,, *lasiocarpa* ... ... (Badly injured by *Dreyfusia* sp.)	A	4	9	5	3
,, *lasiocarpa* var. *coerulescens* ... (Badly injured by *Dreyfusia* sp.)	A	4	2	5	7
,, *concolor*	A	4	1	10	11
,, ,, ...	B	3	4	10	6
,, ,, ...	C	4	0	10	6
,, *grandis*	A	4	3	9	3
,, ,, ...	B	3	5	10	3
,, ,, ...	C	4	2	10	2
,, *nobilis*	B	3	0	10	6
,, *nobilis* var. *glauca* ... ... (Grafted plant)	A	2	0	4	3
,, *Fraseri* (All plants have been badly injured by spring frosts and no plant has made satisfactory growth. All are stunted and subject to attack by *Dreyfusia* sp.)					
,, *magnifica* ... ... (A poor stunted plant in 1925, now growing freely)	A	1	7	6	2
,, *religiosa* (Killed by spring frosts)					
,, *pectinata* (All the plants were badly frozen during three successive springs and the average growth since 1925 has been only 2 ft.)					
,, *koreana*	A		7	4	5
,, ,, ... (This has been the most successful of the new Eastern Firs. It has escaped injury by frost)	B		10	5	1
Tsuga canadensis	A	4	5	7	1
,, ,, ...	B	4	5	8	3
,, ,, ...	C	4	5	6	9
,, *caroliniana*	A	1	0	4	9
,, ,, ...	B	1	1	5	2

		Height at planting time (1925)		Present height (1930)	
		ft.	ins.	ft.	ins.
Pseudotsuga Douglasii	A	2	0	8	0
,, ,, ...	B	2	2	6	3
,, *japonica*	A	2	0	5	0
Larix leptolepis	A	3	9	16	3
,, ,, ...	B	3	7	15	0
,, ,, ...	C	3	9	14	0
,, *eurolepis*	A	1	7	13	6
,, ,, ...	B	1	5	12	0
,, *europaea*	A	2	0	9	0
,, ,, ...	B	3	2	15	3
,, ,, ...	C	3	0	20	0
,, *occidentalis*	A	2	6	5	3
,, ,, ...	B	2	6	8	9
,, ,, ...	C	2	6	5	0
Cedrus atlantica	A	2	4	8	0
,, ,, ...	B	1	9	7	9
,, ,, ...	C	1	9	7	5
,, *Deodara*	A	1	11	7	6
,, ,, ...	B	1	7	5	4
,, ,, ...	C	2	0	10	0
,, *Libani*	A	1	1	4	7
,, ,, ...	B	1	0	3	1
,, ,, ...	C		8	1	9
Cryptomeria japonica	A	2	10	13	0
,, ,, ...	B	3	4	9	6
,, ,, ...	C	3	0	14	0

XXVII. — CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA. VI.* New and Noteworthy Species from British Guiana, Dilleniaceae-Connaraceae.

N. Y. Sandwith.

The following descriptions, new combinations and records refer to species collected by the Oxford University Expedition to British Guiana in 1929, or to others which have been studied in the course of recent investigations into the flora of the Colony. Preference has been given to the more noteworthy trees, many of which are of local interest and possess vernacular names. Thanks are due to the authorities of the Utrecht herbarium for the generous loan of type material, and to those of the Herbarium of the Muséum d'Histoire Naturelle, Paris, and the British Museum (Natural History) herbarium for the privilege of examining numerous historic specimens.

*Continued from *K.B.* 1931, p. 61.

Tetracera surinamensis *Miq.* in Linnaea xviii. 265 (1844). Moraballi Creek, Essequibo River, Oct. 18th, 1929, *Sandwith* 479. Demerara River, May, 1889, *Jenman* 4897. Compared with the type.

Vernacular name (Arawak), Kabaduli.

Distr. Surinam, French Guiana.

Doliocarpus major *J. F. Gmel.* Syst. 805 (1791).—*D. dentosus* Mart. in Flora xxiv. App. ii. 65 (1841); Eichl. in Mart. Fl. Bras. xiii. pars i. 75 (1863).

Wooded shore of islet at the Akaio Falls, Cuyuni River, Nov. 25th, 1929, *Sandwith* 686: climber over low trees; petals and filaments creamy-yellow; fruit deep vermilion. Corentyne River, Nov. 1879, *Jenman* 333.

Distr. Widely spread over Continental Tropical America, from Guatemala to Southern Brazil.

VIOLACEAE.

Rinorea pubiflora (*Benth.*) *Sprague et Sandwith*, comb. nov.—*Passoura guianensis* Aubl. Hist. Pl. Guiane, ii. Suppl. 21, t. 380 (1775), non *Rinorea guianensis* Aubl. *Conohoria Passoura* DC. ex Ging. apud DC. Prodr. i. 312 (1824) partim. *Alsodeia pubiflora* Benth. in Hook. Journ. Bot. iv. 106 (1842). *A. guianensis* Eichl. in Mart. Fl. Bras. xiii. 387 (1871) partim, excl. vars. *Rinorea Passoura* Kze. Rev. Gen. i. 42 (1891); Blake in Contr. U.S. Nat. Herb. xx. 507-9 (1924); Melchior in Engl. et Prantl, Pflanzenfamilien, 2 Aufl., Band 21, p. 352 (1925).

Plentiful in mixed and mora forest on the right bank of the Cuyuni River below the Akaio Falls, Nov. 20th, 1929, *Sandwith* 624. Not found by the Moraballi Creek, where the common species was *R. Riana* (DC.) Kze.

The combination *Rinorea Passoura* (DC. ex Ging. apud DC.) Kze. has been adopted for this common species of Northern South America by Blake and Melchior in their recent important contributions to the study of the genus, but it is invalid (as a combination) since it is founded upon a name which was itself invalid. *Conohoria Passoura*, as pointed out by Blake, was based on two distinct species, *C. flavescens* Aubl., which was the original species of *Conohoria*, and *Passoura guianensis* Aubl.; Gingins and de Candolle appear to have seen specimens only of the first of these, and the very meagre description of the leaves and flowers may also be taken to apply to it rather than to *Passoura guianensis*, of which only the fruit and leaves were seen and collected by Aublet. The name *Conohoria Passoura* was therefore invalid, for the prior name *C. flavescens* should have been retained; and even if we ignore the synonym *flavescens*, and consider that the description applies to *Passoura guianensis*, the trivial *guianensis* should have been adopted under *Conohoria*. Thus Eichler rightly made the combination *Alsodeia guianensis* (Aubl.)

Eichl. when dealing with this plant in the Flora Brasiliensis, in which he adopted the name *Alsodeia* for the genus. The adoption of the trivial *guianensis* under *Rinorea* for this plant is, however, precluded, as Aublet himself had already used *Rinorea guianensis* for another species; and even if he had not, his *Riana guianensis*—now *Rinorea Riana* (DC. ex Ging. apud DC.) Kze. would have a prior claim, as it was published in an earlier volume of his work. The first valid trivial for *Passoura guianensis* in the genus *Rinorea* is therefore Bentham's *pubiflora*, which was published as a species of the genus *Alsodeia*, and the necessary new combination is accordingly made here. There seems to be no doubt that Bentham's plant is the same as Aublet's, but even if it were proved to be different, his name *pubiflora* would stand for the large series of specimens from the Guianas and Brazil which agree so well with Bentham's type.

R. flavescens (*Aubl.*) *Kze.* Rev. Gen. i. 42 (1891); Blake in Contr. U.S. Nat. Herb. xx. 507 (1924). —*Conohoria flavescens* Aubl. Hist. Pl. Guiane, 239, t. 95 (1775).

Comparison with Aublet's specimen at South Kensington and with other more recently collected material from French Guiana shows that the following sheets from British Guiana are referable to this very distinct species with glabrous ovary and fruit and (in dried specimens) reddish veins on the lower surface of the papery leaves: bank of the Moraballi Creek, Essequibo River, Sept. 14th, 1929, *Sandwith* 255; without locality, *Parker*; Hurishi, Karakara Creek, Demerara River, Feb. 1910, *C. W. Anderson* 468; Moblissa Creek, Demerara River, Feb. 1910, *C. W. Anderson* in Forestry Department record no. 562; Canje River, Berbice, Dec. 1914, *Hohenkerk* in ditto no. 638.

Vernacular names (Arawak): Ifa-kuti (Duck's foot); Baridi-kuti (Chicken Hawk's foot); Mamusaru (Swizzle-stick Tree).

Paypayrola longifolia *Tul.* in Ann. Sci. Nat. sér. iii. vii. 372 (1847).

A very plentiful small tree by the Moraballi Creek, Essequibo River, Aug. 21st, 1929, *Sandwith* 81.

Vernacular name (Arawak), Adebero.

No specimens have been seen from the colony which can be referred to *P. guianensis* Aubl., which differs in its broader leaves and broader, more roundish sepals. *Sagot* 32 and *Wachenheim* 43 agree very well with Aublet's specimen of *P. guianensis* in Herb. Mus. Brit.

FLACOURTIACEAE.

Laetia procera (*Poepp. et Endl.*) *Eichl.* in Mart. Fl. Bras. xiii. pars i. 453 (1871).—*L. cascareoides* Sagot ex Benth. in Journ. Linn. Soc. v. App. ii. 85 (1861). *Samyda procera* Poepp. et Endl. Nov. Gen. et Sp. iii. 67 (1845).

Moraballi Creek, Essequibo River, Nov. 5th, 1929, *Sandwith* 559. Tall tree, 110-120 ft. high, 15 in. diam., in mixed forest. Fl. white,

on pink pedicels. Stamens about 15. The other collection in Herb. Kew. is *Hohenkerk* in Forestry Department record no. 830, from hill-slope at head of Paidaka Creek, Berbice River, Nov. 1919.

Vernacular name (Arawak), Warakaiaro.

Distr. Trinidad, Guiana, Amazonian Brazil.

Casearia singularis *Eichl.* in Mart. Fl. Bras. xiii. pars i. 473, t. 95, f. ii. (1871).

Moraballi Creek, Essequibo River, Oct. 2nd, 1929, *Sandwith* 364. Middle-sized tree, 60 ft. high, 6 in. diam., in mixed forest. Bark dark grey, with conspicuous eye-like lenticels. Fl. white.

Vernacular name (Arawak), Shibadan.

Distr. Surinam; Pará, coll. *Ducke*, det. *Kuhlmann*. Apparently the first record for British Guiana.

Polygalaceae.

Securidaca pyramidalis *Sprague*, sp. nov.; affinis *S. pubiflorae* Benth., a qua sepalis lateralibus (alis) margine excepto glabris, racemis paucioribus brevioribus pyramidalibus, foliis plerumque minoribus ovatis differt.

Frutex scandens. *Ramuli* subteretes, nigrescentes, circiter 2·5 mm. diametro 20 cm. infra apices, breviter dense furfuraceo-pilosi; internodia plerumque 1–2·5 cm. longa. *Folia* breviter petiolata, ovata vel rarius ovato-oblonga, vix vel breviter obtuse cuspidata, basi rotundata, 4–9 cm. longa, 2·5–4·7 cm. lata, coriacea, aetate manifeste discoloria, supra valde intricate reticulata, rete elevato, nitidula, nervo medio inferne et marginis parte basali plus minusve pilosis exceptis glabra, exsiccando brunnea, subtus opaca, minute appresse pubescentia, satis reticulata rete elevato; nervi laterales utrinque 7–9, subarcuato-ascendentes, supra prominuli, subtus prominentes; petioli 3–5 mm. longi, ut ramuli induti. *Racemi* terminales et in axillis foliorum superiorum axillares, 3–6 cm. longi, anguste pyramidales; pedunculi usque ad 1·5 cm. longi, ut rhachis bracteae pedicellique subappresse striguloso-pubescentes; bracteae lineari-lanceolatae, 3–4 mm. longae; pedicelli 3–4 mm. longi. *Sepala* 3 exteriora ciliata, extra praeter areas marginales glabratas densius sparsiusve appresse pubescentia, intus glabra; sepalum posticum cymbiforme, 4–5 mm. longum; sepala antica elliptica, 3 mm. longa, 2–2·3 mm. lata.; alae unguiculatae, late elliptico-suborbiculares, 8·5 mm. longae, 7·5 mm. latae, margine anteriore basi auriculatae, margine posteriore basi rotundatae, dimidio marginis inferiore ciliato, superiore breviter inflexo non ciliato, alae ceterum glabrae; nervi e basi 9–10, flabelliformi-divergentes, laterales pluries furcati, procul a margine anastomosantes; alarum ungues 2 mm. longi. *Petala* 2 lateralia ungue 2 mm. ad vaginam staminum antice adnato valde incrassato extra postice piloso intus velutino; lamina petalorum lateralium oblongo-obovoidea, 4·5 mm. longa, 3·5 mm. lata, sed primo visu minor ob marginem anteriorem ad medium inflexum, dimidio inferiore tantum

ciliato, ceterum glabra ; carina ungue 2 mm. longo vix 2 mm. ad vaginam staminum adnato, late cymbiformis, 6 mm. longa crista exclusa, marginibus dimidio inferiore ciliatis, crista 0·8 mm. longa flabellata crenulato-dentata. *Ovarium* glabrum.

British Guiana. Kurupung River, by water-side, fl. Sept. 1925, *Altson* 415 (type). Also collected on the Potaro River, Kaieteur Savannah, by *Jenman* (no. 806), in Sept.-Oct. 1881.

Securidaca pyramidalis seems to be closely related to *S. pubiflora* Benth., which has leaves of much the same texture and indumentum, but larger, more oblong, and with the midrib pubescent on the upper surface. The inflorescences of the two species are more dissimilar, *S. pubiflora* having 5–6 racemes grouped in bracteate corymbs towards the end of the branchlets, whereas *S. pyramidalis* has fewer racemes on each flowering branchlet, and the lateral ones arise in the axils of foliage-leaves. An additional diagnostic character is that the lateral sepals (alae) of *S. pubiflora* are silky-pubescent outside, whereas those of *S. pyramidalis* are glabrous, apart from the margins, which are ciliate below.

In Martius, Fl. Bras. vol. xiii. pars iii, p. 66 (1874), A. W. Bennett included at least two species under the name *Securidaca longifolia* Poepp. et Endl., namely *S. pubiflora* Benth., and *S. latifolia* Benth. *S. pubiflora* may possibly be conspecific with *S. longifolia*, though the latter seems from description to differ in having relatively narrower, acute leaves, 6 inches long and 2 inches broad. *S. latifolia*, however, may be distinguished by the glabrous alae, and by the leaves which are puberulous and dull on the upper surface, and with spreading hairs on the midrib on the lower surface.—T.A.S.

Hypericaceae.

Vismia angusta *Miq.* in Linnaea xviii. 27 (1844) ; Stirp. Surinam. Sel. 88 adnot. (1850).—*V. macrophylla* Benth. in Hook. Lond. Journ. Bot. ii. 371 (1843), non H.B.K. Nov. Gen. et Sp. Pl. v. 184 (1822).

Moraballi Creek, Essequibo River, Oct. 7th, 1929, *Sandwith* 395. Middle-sized tree, 61 ft. high, 10 in. diam., in "low bush." Bark dark brown, peeling in longitudinal flakes ; timber yellow. Branchlets, inflorescence, all veins of lower surface of leaves, and midrib of upper surface, ferrugineous-tomentose. Sep. and pet. greenish.

Vernacular names, Orali (Arawak) ; Bloodwood.

From a comparison with *Hostmann* 162, which Miquel himself referred to his *V. angusta*, the above seems to be the correct name for this common species of Northern South America and especially of Guiana, which has been repeatedly identified with *V. macrophylla* H.B.K. and with *V. latifolia* (Aubl.) Choisy. A recent examination of the Humboldt and Bonpland specimen of *V. macrophylla* at Paris shows that it differs, as would be expected from the description, in the indumentum of the lower surface of the leaves, which are glabrous with black gland-dots, except for very scattered, minute, reddish stellate hairs. The nearest approach to this specimen which

has been seen is Spruce's plant from San Gabriel da Cachoeira, Rio Negro, ann. 1852, without number. This was referred to *V. macrophylla* by Reichardt in his account of the genus in the Flora Brasiliensis, and it is the type collection of *V. macrophylla* var. *glabrescens* Hochr. in Ann. Cons. Jard. Bot. Genève, xxi. 53 (1919). It is clear from Hochreutiner's remarks, and from the distinguishing characters which he assigns to his variety, that he had not examined the type collection of *V. macrophylla*; this plant of Spruce, in fact, agrees well with that type. It is not improbable that future monographers will decide to treat *angusta* as a variety of *macrophylla*, since further good distinguishing characters are not apparent. The size and shape of the leaves of *angusta* are extraordinarily variable on the same tree.

V. latifolia (Aubl.) Choisy, based upon *Hypericum latifolium* Aubl., is proved by Aublet's specimen in Herb. Mus. Brit. to be a very different species. The leaves are up to 8 inches in length and 4·25 inches in width. They are thin, and dry green on the upper surface, which is prominently reticulate (the veinlets not impressed) as in Aublet's figure. They are rounded or scarcely cordate at the base, and the acumen is 5–12 mm. long. The petals are glabrous, and hardly dotted on the outer surface. Two sheets of Martin (no. 27 and another) in Herb. Mus. Brit. agree well with this plant, while the nearest approach to it at Kew is a specimen of Sagot collected (without number) at Roura in March, 1859, and labelled *Vismia acuminata* Pers. The species seems to be related to *V. falcata* Rusby.

V. latifolia H.B.K. l.c. 183 (1822, *fide* Barnhart in Bull. Torr. Bot. Club. xxix. 595) is invalidated by *V. latifolia* (Aubl.) Choisy (1821). This species and *V. ferruginea* H.B.K. l.c. 183 have been examined at Paris and neither agrees with *V. angusta*; while the Schomburgk collections referred by Reichardt (Mart. Fl. Bras. xii. pars i. 201) to *V. ferruginea* are certainly not that species.

GUTTIFERAE.

Clusia Fockeana *Miq.* in Hoev. et De Vriese, Tijdschr. x. 82 (1843).

The following collections are referable to this species, which is a tree characteristic of wallaba forest and sandy districts: Moraballi Creek, Essequibo River, Sept. 28th, 1929, *Sandwith* 352; tree with stilt roots, 57 ft. high, in wallaba forest on sandy ridge; buds pink; petals white, purplish at base. In "high bush" east of Ikwaka Lake, Oct. 1923, *Altson* 144. West side of Ikuruwa Lake, Canje River, Berbice, Jan. 1915, *Hohenkerk* in Forestry Department record no. 660. Kuruabaru River, Demerara River, in "Muri" white sand area, Aug. 1919, *Hohenkerk* in ditto, no. 660D. Upper Demerara River, Sept. 1887, *Jenman* 4262. Santa, Demerara River, Dec. 1908, *C. W. Anderson* 239.

Vernacular names, Kupe and Madaburi.

Distr. Surinam.

Tovomita cephalostigma *Vesque*, Epharmosis iii. t. 96 (1889); in DC. Monog. Phan. viii. 207 (1893).—*T. guianensis* Engl. in Mart. Fl. Bras. xii. pars i. 446 (1888) partim, non Aubl.

Moraballi Creek, Essequibo River, Oct 7th, 1929, *Sandwith* 391, ♀. Middle-sized tree, 60–80 ft. high, in wallaba forest on ridge. Leaves rather leathery. Bracteoles and buds reddish-brown. Sep. and pet. 4, greenish-white. Stamens white.
Distr. Guiana.

The specimens were found to agree excellently with the type material (*Mélinon* 435, ♀) in the Paris Herbarium. The male inflorescences of this species are remarkably elongated, repeatedly branched and many-flowered, in strong contrast with the short, few-flowered inflorescences of female trees. Four sheets of the male plant, collected by Mélinon—no. 79 (1862) and three sheets *sine numero* (1864)—were found in the Paris Herbarium in the herbier de la Guyane; these had not been identified by Vesque and have perhaps been laid in quite recently. The following additional collections in the Kew Herbarium should be referred to this species, which has sometimes been identified with *T. guianensis* Aubl.

French Guiana. *Poiteau* in Herb. Gay, ♀; *Wachenheim* 325, ♂.

British Guiana. Demerara River, May, 1887, *Jenman* 3909, ♂; Upper Demerara River, Sept. 1887, *Jenman* 4259, ♀; Berbice-Demerara watershed, on hill top on white sand, *Hohenkerk* in Forestry Department record no. 140 C, ♂; on brown sand and clay on hill-slope, Jutura Creek, Siroppa River, Essequibo River, July 1920, *Hohenkerk* in ditto, no. 140 D, ♂; on sand bank, Macreba Falls, Kurupung River, Mazaruni River, Aug. 1925, *Altson* 350, ♂.

From the evidence of the field-notes, it would appear that this species is characteristic of sandy soil on hills, and that it is a common member of the wallaba (*Eperua*) forest-type.

T. guianensis *Aubl.* Hist. Pl. Guiane, 956, t. 364 (1775).

It is clear that this species has been misinterpreted both in the Flora Brasiliensis by Engler, who described the lateral nerves of the leaves as 3–5 mm. apart, and in the De Candolle Monographia of the Guttiferae by Vesque, who similarly placed it in his section *Clusiae-foliae*, comprising species with very numerous, approximate, parallel and straight lateral nerves. The Guiana material cited by Engler evidently belongs to *T. cephalostigma*, while Vesque admits his uncertainty as to the identity of this species. Aublet's specimen at the British Museum proves to be nothing like the specimens which have been referred to it in the Kew Herbarium, but to belong to Vesque's section *Chrysochlamydifoliae*, which consists of species with few, widely separated, arcuate nerves. One would have thought that this much would have been gathered from Aublet's figure. The leaves of his specimen are reddish beneath, the lateral nerves very arcuate, and the minor venation conspicuous. The affinity seems to be with *T. Schomburgkii* Pl. et Tr. The only specimen at Kew

which approximates to *T. guianensis* is one of Poiteau, presented to Herb. Gay. in July 1824.

T. Schomburgkii *Pl. et Triana* in Ann. Sci. Nat. sér. iv. xiv. 274 (1860).

The following recent collections agree with Schomburgk's type material: Moraballi Creek, Essequibo River, in various forest-types, Sept.-Oct. 1929, *Sandwith* 240, 409, 519; small tree, up to about 40 ft. high. Malali, Demerara River, Oct.-Nov. 1922, *la Cruz* 2733.

Vernacular name (Arawak), Fine-leaved Awasakuli; but this name is probably applied to other small species of *Tovomita*.

Quapoya bracteolata *Sandwith*, nom. nov.—*Rengifa acuminata* Pl. & Triana in Ann. Sci. Nat. sér. iv. xiv. 243 (1860); Engl. in Mart. Fl. Bras. xii. pars i. 434 (1888). *Quapoya acuminata* Kze. Rev. Gen. 61 (1891); Engl. in Engl. et Prantl, Pflanzenfam. 2 Aufl., Band 21, p. 205 (1925); non *Q. acuminata* Walp. Rep. i. 393 (1842)=*Clusia acuminata* Spreng. Syst. Veg. ii. 599 (1825).

The species of *Rengifa* have to be transferred to the genus *Quapoya* Aubl., since *R. scandens* (Aubl.) Pl. & Triana is the original species of *Quapoya*; and, unfortunately, the trivial name *acuminata* is preoccupied in *Quapoya* by the West Indian plant which is now known as *Rheedia portoricensis* Urb. The above new name is therefore proposed for the curious, scrambling, epiphytic shrub which appears to be endemic in British Guiana, and of which the following specimens have been seen:—

British Guiana. Roraima, *Schomburgk* 999 (type) and 1715 B; Kalakoon, Nov. 1886, *Jenman* 2432; Demerara River, March 1898, *Jenman* 7334; Macouria River, Essequibo River, Nov. 1886, *Jenman* 2478; Moraballi Creek, Essequibo River, in mora swamp-forest, Aug.-Sept. 1929, *Sandwith* 16, 242; Rockstone, March 1899, *Jenman* 7502.

Rheedia floribunda (*Miq.*) *Pl. et Tr.* in Ann. Sci. Nat. sér. iv. xiv. 319 (1860).—*Garcinia floribunda* Miq. Stirp. Surinam. Sel. 89 (1850).

In mixed forest, Moraballi Creek, Essequibo River, Oct. 25th, 1929, *Sandwith* 522. Small tree with yellow latex, 50 ft. high, $4\frac{1}{2}$ in. diam. Leaves very variable in size. Fruit green, reticulate-rugose when fresh, turning yellow, edible.

Vernacular name (Arawak), Assashi.

Distr. Surinam.

The fruits are characteristic of the section *Verticillaria*, and the leaves agree with those of the type collection (*Hostmann and Kappler* 593a) at Paris. On the Paris specimen one of the leaves is 8 in. long and slightly more than 3 in. wide, dimensions exceeding those given by Miquel; and since the specimen is only the top of a flowering shoot, the lower leaves would almost certainly be still larger.

Quiina indigofera *Sandwith*, sp. nov.; inter species floribus unisexualibus gaudentes floribus masculis pentameris, fructibus longis, praesertim partibus gummiferis exsiccatis contusis indici colorem conspicuum exhibentibus distinctissima.

Arbor mediocris, 15–24 m. alta, verosimiliter ad 30 cm. diametro, gummam fragrantem praebens quae in statu sicco per medullam ramulorum faciem foliorum praesertim juniorum inferiorem atque flores ipsos colore indici insigni tincta videtur; truncus basi anteridibus gralliformibus parvis praeditus. *Ramuli* summi subteretes, hic illic lenticellati, novelli pubescentes, vulgo 3–7 mm. diametro; internodia 2–8 cm. longa. *Folia* opposita, elliptica, obovato-elliptica vel obovato-lanceolata, apice acuta vel brevissime cuspidata, basi attenuata cuneata, 14–35 cm. longa, 4·5–14 cm. lata, rigide chartaceo-coriacea, integra, glabra, costa nervisque primariis utroque costae latere vulgo 16-20 marginem versus valde arcuatis utrinque perconspicuis, venulis supra impressis subtus haud valde prominentibus, subtus siccitate hic illic (juniora nonnunquam passim) colore indici plus minusve conspicue tincta; petiolus corrugato-striatus, glaber vel sparse pubescens, 1·3–2·5 cm. longus, sursum 2–3 mm. diametro, basi valde incrassatus. *Stipulae* pubescentes, summae annotinae ac hornotinae lineares, 1·3–2·5 cm. longae, 2-3 mm. latae, nonnunquam ferrugineae vel indico coloratae; annotinae inferiores multo breviores ac angustiores, subulatae, pungentes, 5–10 mm. longae, basi excepta plerumque vix 1 mm. latae. *Inflorescentiae* axillares, breves, petiolo breviores; racemi complures aggregati, pluriflori, basi bracteis conspicue congestis, pubescentes; bracteae bracteolaeque confertae, pubescentes, illae ferrugineae triangulari-ovatae 1·2 mm. longae atque latae, hae minores. *Flores* singuli vel ad 3 cymoso-fasciculati, unisexuales, masculi tantum visi; pedicelli graciles, glabri, paullo supra basim articulati, ad 1·3 cm. longi; alabastra globosa, ad 2 mm. diametro. *Sepala* 5 inaequalia, late rotundato-ovata, ciliata, intus glabra, siccitate ochracea vel indico maculata, exteriora 1 mm. longa 1·5 mm. lata, interiora 1·5–2 mm. longa 1·75–2 mm. lata. *Petala* 5, obovato-oblonga, minute ciliata, siccitate saepius passim indico tincta, 4–4·5 mm. longa, 3 mm. lata. *Stamina* circiter 30, 4–4·5 mm. longa, filamentis siccitate passim indico coloratis basi cohaerentibus. *Fructus* complures aggregati, pedicellis ferrugineis glabris 1–1·5 cm. longis 1·5–2 mm. diametro, statu vivente virides, siccitate brunneo-purpurei, tenuiter conspicue multistriati, gummiferi, glabri, recti vel falcati, apice attenuati saepe acuti, basi rotundati, anguste lanceolati vel lanceolato-ellipsoidei, 3–5·5 cm. longi, 0·8–1·5 cm. diametro, endocarpio fibroso, biloculares sed saepius ut videtur abortu monospermi; semen anguste obconico-obovoideum, densissime lanatum, lana subnitente pallide fulva, 1·2–1·4 cm. longum, apice 5–6 mm. diametro.

BRITISH GUIANA. Moraballi Creek, Essequibo River, October 15th, 1929, *Sandwith* 458 (type). A middle-sized tree in mixed

forest, 78½ ft. high, 9 in. diameter, with small stilt buttresses. Fruit green, finely and conspicuously striate.

Karakara Creek, Demerara River, February 15th, 1910, *C. W. Anderson* in Forestry Department record no. 51. "Large tree with very hard wood, and yellow, edible, stringy fruit."

Dense upland forest, Tumatumari, June-July 1921, *Gleason* 424. "Tree, 50 ft. high." The description of the inflorescence is taken from this collection.

Vernacular names: Large-leaved Okokonshi (Arawak); Ariwiwa (Warrau).

Q. guianensis *Aubl.* Hist. Pl. Guiane, Suppl. 19 (1775).

A small tree, 15–30 ft. high, very abundant in mixed forest and low bush by the Moraballi Creek, Essequibo River, Nov. 8th, 1929, *Sandwith* 576. This, like other collections from British Guiana, agrees with the authentic specimen in Herb. Mus. Brit.

Vernacular name (Arawak), Small-leaved Okokonshi.

Distr. Trinidad, Guiana.

BOMBACACEAE.

Bombax flaviflorum *Pulle* in Rec. Trav. Bot. Néerl. ix. 150 (1912).

Moraballi Creek, Essequibo River, Oct. 29th, 1929, *Sandwith* 532. Small tree, in wallaba forest on sandy ridge. Compared with authentic material (*Gonggrijp*, and *Forestry Bureau* 6283 and 1607) borrowed from Utrecht. The indumentum, leaflets, and long solitary peduncle of the young fruit agree well, but flowering material is required for confirmation of the identification.

Vernacular name (Arawak), Kamakuti (of wallaba).

B. surinamense *Uitt.* in Rec. Trav. Bot. Néerl. xxii. 365 (1925).

Moraballi Creek, Essequibo River, Oct. 24th, 1929, *Sandwith* 511. Tall tree, 135 ft. high, 3 ft. 8 in. diam., in morabukea forest. Petals creamy yellow within, whitish-sericeous on the back.

Vernacular name, Kamakuti (Tapir's Foot).

The specimens agree perfectly with the type. Previously unrepresented at Kew, although there are British Guiana specimens of an allied species which is apparently referable to *B. globosum* Aubl. The type of the latter was not found at South Kensington.

TILIACEAE.

Lueheopsis flavescens (*Uitt.*) *Burret* in Notizbl. Bot. Gart. Berlin, ix. 837, 842 (1926).—*Luehea flavescens* Uitt. in Rec. Trav. Bot. Néerl. xxii. 363 (1925).

Moraballi Creek, Essequibo River, Oct. 19th, 1929, *Sandwith* 486. Tall tree, 116 ft. high, 19 in. diameter, in wallaba forest on sandy ridge. Fallen fruits and old, very rugose, leaves collected.

The tree was scarce in the area, and was unknown to the Arawaks who felled it. The material agrees with that from the type tree (*Zaandam* 6678), which was borrowed from Utrecht, in its fruits and the very characteristic indumentum of the lower surface of the

leaves. First record for British Guiana. The inflorescence, which appears before the leaves, is now required.

Apeiba Petoumo *Aubl.* Hist. Pl. Guiane, 544, t. 215 (excl. fructu) (1775).—*A. echinata* Gaertn. emend. Uittien in Rec. Trav. Bot. Néerl. xxii. 360 (1925).

In mixed forest, Moraballi Creek, Essequibo River, Aug.-Nov. 1929, *Sandwith* 73, 430, 622. Other British Guiana collections, compared with Aublet's specimen in Herb. Mus. Brit., are *Jenman* 1616 (Pomeroon River, Dec. 1882); *Jenman* 4135 (Upper Demerara River, Sept. 1887); *Appun* 344 ("Essequebo"); and *im Thurn* (Cabalebo River, Corentyne River, Sept. 1879). The Moraballi Creek examples were trees about 100 ft. high and $1\frac{1}{2}$–3 ft. in diameter.

Vernacular name (Arawak), Duru.

Distr. Guiana to Pará.

ELAEOCARPACEAE.

Sloanea sinemariensis *Aubl.* and **S. Eichleri** *K. Schum.*

In Rec. Trav. Bot. Néerl. xxii. 352-4 (1925) H. Uittien has some remarks on *Sloanea sinemariensis* Aubl. and its allies, and shows how much confusion has attached to this name, which has been incorrectly applied to several different species from the West Indies and Northern South America. It is unfortunate that Uittien himself has omitted to examine Aublet's specimen, and has fallen into the rather frequent error of treating Aublet as a careless observer who omitted to mention important details and therefore gave inaccurate or incomplete descriptions. Uittien gives two localities for *S. sinemariensis* Aubl. in Surinam, and goes on to say that "Aublet has overlooked the dense but extremely short indumentum of the lower surface of the leaves, which induced Sagot to describe a variety *Melinonis* 'foliis subtus puberulo-subcanescentibus.'"

But Aublet's specimen at the British Museum agrees with his description and figure, and although the reddish-brown lower surface of the leaves is not completely glabrous when examined with a lens, it certainly appears so to the naked eye; whereas the leaves of var. *Melinonis* are conspicuously and densely cinereous-tomentellous all over the lower surface, and are so strongly reticulate that they present a totally different appearance. Again, the characters of the stamens of *Melinonis* seem to be quite different from those of *sinemariensis*; the filaments of *Melinonis* are long and pilose, while the pilose anthers are short, whereas the filaments of *sinemariensis* are, as described by Aublet, very short, and the anthers are long and glabrescent. Var. *Melinonis* is, in fact, a well-marked and remarkably uniform species with a wide range in Guiana, and cannot possibly be treated as a variety of *sinemariensis*, from which it was admirably differentiated by Sagot himself.

As has been correctly pointed out by Uittien, this plant (*S. sinemariensis* var. *Melinonis* Sagot=*S. sinemariensis* Uitt. non

Aubl.) is conspecific with *S. Eichleri* K. Schum.; this name must therefore be adopted for it in the future. The Guiana material appears to bear better developed inflorescences than the Brazilian specimens which were originally examined by Schumann, and there are therefore certain discrepancies in the shape and measurements of some of the floral parts; but there seems to be no reasonable doubt, from a comparison with *Riedel* 1452 in Herb. Kew., that the same species is represented. The following is a description of *S. Eichleri* taken from Guiana material :—

Sloanea Eichleri *K. Schum.* in Mart. Fl. Bras. xii. pars iii. 183, t. 38 (i) (1886); a *S. sinemariensi* Aubl. foliis subtus passim dense cinereo-tomentellis, nervis tertiariis creberrimis fortiter reticulatis, filamentis longis conspicue pilosis, antheris brevioribus pilosis differt.—*S. sinemariensis* Aubl. var. *Melinonis* Sagot in Ann. Sci. Nat. sér. vi. xi. 156 (1881); H. Uittien in Rec. Trav. Bot. Néerl. xxii. 353 (1925).

Arbor mediocris, ramulis summis dense minute cinereo- vel fulvo-tomentellis. *Folia* elliptico-oblonga ad suborbicularia, apice truncata vel rotundata, nunc brevissime triangulariter acute ad 5 mm. cuspidata, nunc late emarginata, basi rotundata, 6·5–31 cm. longa, 5–19·5 cm. lata, margine praesertim dimidio superiore plus minusve sinuato-angulato nonnunquam fere dentato, supra siccitate opaca vel subnitida brunnea vel plumbeo-purpurascentia, adulta glabra nisi costa nervisque primariis impressis dense tomentellis vel glabrescentibus, nervis tertiariis vix conspicuis, subtus opaca cinerea intricatissime reticulata passim minute densissime tomentella, nervis primariis arcuantibus utrinque conspicuis utroque costae latere 6–10; petiolus subteres, indumento ramulorum tomentello praeditus, 1·3–8·5 cm. longus, ad 2·5 mm. latus. *Inflorescentiae* axillares, solitariae, composito-racemosae, apice corymbosae, saepe ramulis longis e basi exorientibus, totae dense cinereo-pilosulae, 2–4 cm. longae; bracteae bracteolaeque subulatae, 0·5–3·5 mm. longae; pedicelli 0·3–1·5 cm. longi. *Calyx* irregulariter ad 8-lobus, lobis fere subulatis vel triangulari-lanceolatis 0·5–1·5 mm. longis, ad 0·75 mm. latis, extra dense intus sparse pilosulis. *Stamina* numerosissima: filamenta conspicue pilosula, longitudine valde variabili, 1–2·75 mm. longa; antherae elliptico-oblongae, obtusae, 1·25–1·5 mm. longae, conspicue satis dense pilosulae. *Ovarium* 4-loculare, ovoideo-subglobosum, 1·75 mm. altum, ad 1·5 mm. diametro, dense tomentellum; stylus quadrangulatus, sulcatus, apice truncato 4-fido, ad 2·2 mm. longus, basim versus tomentellus, ceterum glaber; ovula in quoque loculo 10–12. *Fructus* ovoideo-ellipsoideus, 1·5–1·7 cm. longus, ad 1 cm. diametro, densissime cinereo- vel fulvo-tomentellus, setis fulvo-rubentibus vel purpurascentibus patulis 0·4–1·2 cm. longis prorsus minute pilosulis satis tenuiter rigidis facile caducis indutus.

Brazil. Ann. 1828, *Riedel* 1452.

French Guiana. Ann. 1864, *Mélinon*; *Poiteau*.

Surinam. Vide *Uittien*, l.c. supra. Watramiri, tree no. 1676, June 1916 !

British Guiana. Berbice : Huruwe Creek, Ituni River, Berbice River, March 1919, *L. S. Hohenkerk* in Forestry Department record no. 345. " Tree 55 feet high, growing in brown sand with clay. Fruit covered with long reddish and purplish-brown stiff hairs ; seed vermilion-coloured."

It may be useful to add a description of Aublet's specimen of *S. sinemariensis* at the British Museum :

Sloanea sinemariensis *Aubl.* Hist. Pl. Guiane, 534, t. 212 (1775).

Folia late elliptico-oblonga ad semiorbicularia, obtusa vel emarginata sinu apicali latissimo, 7–20 cm. longa, 5–16 cm. lata, margine sinuata sed haud revera dentata, supra glabra colore plumbeo costa nervisque primariis profunde impressis, subtus rubro-brunnea oculo nudo glabra et mesophyllo venulisque revera glaberrimis, sed costa nervisque primariis atque secundariis sub lente minute tomentellis valde prominentibus, primariis utroque costae latere 5–9 sursum arcuantibus ; petiolus striatus, minutissime tomentellus, 2·2–8 cm. longus, 1·5–3 mm. diametro. *Inflorescentia* unica tantum valde immatura adest e floribus compluribus ut videtur male evolutis in axilla dense fasciculatis constans. *Sepala* late ovata, obtusa, circiter 2 mm. longa atque 1·5 mm. lata, extra dense tomentella, intus striato-pubescentia ceterum glabra. *Antherae* lineari-oblongae, obtusae, nigrescentes, ut videtur glabrae ; filamenta evidenter brevissima, ut dicit cl. Aublet, vix cernenda. *Ovarium* tomentellum.

French Guiana. *Aublet* in Herb. Mus. Brit. No further material has been seen.

Linaceae.

Hebepetalum humiriifolium (*Planch.*) *Benth.* in Benth. et Hook. fil. Gen. Pl. i. 245 (1862).—*Roucheria humiriifolia* Planch. in Hook. Lond. Journ. Bot. vi. 143 (1847).

Moraballi Creek, Essequibo River, Sept. 24th, 1929, *Sandwith* 332 : tall tree in morabukea forest by creek bank : petals yellowish orange, covered within with white hairs. *Ibid.*, in wallaba forest, Oct. 8th, 1929, with young fruit, *Sandwith* 397 : tall tree, 91½ ft. high, 8 in. diam. Demerara River, May 1889, *Jenman* 4856.

Vernacular name (Arawak), Shiballidanni.

Distr. Guiana to Pará.

Houmiriaceae.

Houmiri balsamifera *Aubl.* Hist. Pl. Guiane, 564, t. 225 (1775).

Moraballi Creek, Essequibo River, Oct. 8th, 1929, *Sandwith* 399 : tall tree, 121 ft. high, 3½–4 ft. diam., in wallaba forest : bark thinly fluted. Upper Demerara River, Sept. 1887, *Jenman* 4136.

Vernacular name (Arawak), Tauroniro or Tawaranru.

Distr. Guiana ; Brazil (Rio Uaupes).

Compared with Aublet's specimen at the British Museum. The leaves of non-flowering shoots are larger and more amplexicaul than the others. One of the larger forest trees, and remarkably distinct from the well-known "Muri bush," *H. floribunda* Mart., of the savannah districts.

MALPIGHIACEAE.

Diplopterys microcarpa *Sandwith*, sp. nov.; *D. pauciflorae* (G. F. W. Mey.) Ndz. (*D. Paralias* Juss.) affinis, forma foliorum, petalis multo minus fimbriatis extra multo magis sericeo-pilosis, praesertim fructu multo minore, alis lateralibus singulis vel si binis omnino confluentibus sine ulla cavitate cristifera marginali differt.

Planta per frutices humiles in fluviorum ripis scandens; ramuli teretes, purpurascentes, glabri vel parce arcte adpresse pilosi, copiose lenticellati; internodia 3–14 cm. longa. *Folia* opposita, ovata ad ovato-elliptica, apice conspicue sensim vel satis abrupte acuminata acumine vulgo 1–1·2 cm. longo, basi attenuata cuneata vel rotundata, 7–17 cm. longa, 2·5–8·5 cm. lata, chartacea, utrinque subnitida, integra, oculo nudo glaberrima, sed utrinque sub lente pilis adpressis malpighiaceis hic illic nonnunquam satis regulariter nonnunquam raris conspersa, utrinque conspicue reticulata, nervis primariis arcuantibus utroque costae latere vulgo 8–10, margine incrassato revoluto hic illic depresso-glanduloso; petiolus supra canaliculatus, adpresse pilosus vel glabrescens, 0·7–1·4 cm. longus. *Inflorescentiae* axillares oppositae atque terminales ternae, breves, congestae, multiflorae, 2–5 cm. longae, totae adpresse sericeo-tomentosae; umbellae vulgo 4-florae in paniculas dispositae, raro simplices; bracteae lineari-subulatae, 2–8 mm. longae; bracteolae ultimae paullo supra basim pedicelli positae, minutae, vix 1 mm. longae; pedicelli plane evoluti 0·4–2 cm. longi. *Alabastra* matura ovoideo-subglobosa, 4–5 mm. longa, 3–4 mm. diametro, sericeo-pilosa. *Sepala* obovato-oblonga vel oblonga, valvata, 2·5–3 mm. longa, 1·5–2 mm. lata, extra apice marginibusque exceptis sericeo-pilosa, intus glabra; glandulae 8, sepalis facile superatae, illae sepali cuiusque inter se liberae, statu vivente virides, siccitate nigrescentes, oblongae vel obovoideo-oblongae, 2–3 mm. longae, ad 1·25 mm. latae. *Petala* lutea; limbus orbicularis ad obovato-oblongus, 6–8·5 mm. longus, circiter 6 mm. latus, regulariter sed haud conspicue fimbriato-laceratus, extra apice marginibusque exceptis sericeo-pilosus, intus glaber; unguis adpresse pilosus, ad 3·5 mm. longus. *Stamina* filamentis ad 3 mm. longis basi dilatatis connatis; antherae glabrae, 1·2–1·5 mm. longae. *Ovarium* dense sericeo-pilosum, circiter 1·2 mm. altum, 1·75 mm. diametro; styli glabri, recti, stigmatibus truncatis umbilicatis inclusis fere 3 mm. longi. *Samarae* dense adpresse pilosae, ad 1 cm. longae, ad 1·4 cm. latae, totae indurato-lignosae; alae laterales utroque latere singulae, vel si binae omnino confluentes, 4–5 mm. latae, basi 3–4 mm. crassae, margine angusto acuto irregulari saepe profunde sinuato; ala intermedia dorsalis semiannuliformis, margine rotundato, 2 mm. lata; nux 6 mm. crassa.

British Guiana. Moraballi Creek, Essequibo River, September 18th, 1929, *Sandwith* 289 (type): climber over low trees and shrubs on creek bank near its mouth: flowers yellow, with green glands. Mazaruni River, September 1880, *Jenman*, 649, 680; *ibid.*, August 1889, *Jenman* 5353, 5370.

Rutaceae.

Hortia regia *Sandwith*, sp. nov.; *H. excelsae* Ducke affinis, foliis gigantibus aequilongis reticulatione simili, his tamen multo angustioribus subtus glabris statim distinguenda.

Arbor excelsa, 18–33 m., vulgo 30 m., alta, 25–27 cm. diametro, per silvas Guianae anglicae septentrionalis pervagata; ramuli summi novelli siccitate rubro-purpurei, nitidi, minutissime pilosuli, 10–12 mm. diametro. *Folia* gigantia apice ramulorum in rosulis insignibus stellatim patule conferta, forma generis typica anguste obovato-lanceolata, apice acuta subacuminata vel juniora 0·5–2 cm. cuspidata, versus basim longissime anguste attenuata, basi ipsa paullum auriculata, 50–95 cm. longa, 7·5–13·5 cm. lata, sub inflorescentia decrescentia, juniora chartacea, adulta coriacea, supra nitida, utrinque glaberrima, crebre nigro-punctata, nervis primariis utroque costae latere circiter 80 parallelis patulis fere rectis a se 5–15 mm. distantibus in nervum marginalem 1–4 mm. a margine crasso revoluto distantem anastomosantibus, nervis primariis atque rete venularum utrinque subaequaliter conspicuis subtus etiam elevatis, costa subtus praesertim basi crassissima. *Inflorescentia* composite corymbose cymoso-paniculata, terminalis, in centro rosulae foliorum surgens, 16 cm. alta, verticem densum immensum omnino planum mensae instar vulgo 30 cm. diametro praebens; ramuli statu vivente brunneo-olivacei, siccitate brunneo-purpurei, primarii 10–12 mm. diametro, tum sensim tenuiores, summi minute pilosuli 2–4 mm. lati; bracteae imae foliaceae, virides, coriaceae, sursum decrescentes; bracteae superiores bracteolaeque brunneo-purpureae, ovatae, concavae, 1–5 mm. longae, 1–3·5 mm. latae; pedicelli roseo-brunnei, minute pilosuli, crassi, 2–4 mm. longi, statu vivente 2 mm. siccitate 1·25–1·5 mm. lati, in calycem sensim ampliati. *Flores* densissime conferti; alabastra matura pulcherrime rosea, ovoidea vel late ovoideo-ellipsoidea, 5–7 mm. longa, 3–4·5 mm. diametro. *Calyx* roseo-brunneus, cupuliformis, extra pilosulus atque verruculoso-glandulosus, intus glaber, 3–4 mm. longus, 4–6 mm. latus, vertice truncato sed in lobos quinque breves, imbricatos, tenues, subscariosos, ciliolatos, late rotundatos, subsemicirculares, ad 0·75 mm. longos, ad 3 mm. latos, divisus. *Petala* anguste elliptico-oblonga, flore aperto 1 cm. longa, 3 mm. lata, apice mucrone ad 1·5 mm. longo inflexo praedita, extra glabra, intus secus medium incrassatum pilis densis barbata, margine intus roseo-purpureo. *Stamina* petalis aequilonga; filamenta albo-carnea, glabra, crassa, sulcata, vix ad 1 mm. lata; antherae 3–4 mm. longae. *Discus* circiter 1 mm. altus, 2·5 mm. diametro, conspicue 5-lobus. *Ovarium* glabrum, statu vivente viride, ovoideum,

5-loculare, sulcatum, vix 1·5 mm. altum, 1·25 mm. diametro, sensim in stylos roseo-purpureos connatos sulcatos ovario fere aequilongos transiens. *Fructus* carnosus, flavus, forma atque magnitudine fructum *Citri aurantifoliae* Swingle simulans, 4 cm. longus, ad 3·5 cm. diametro.

British Guiana. In wallaba forest on sandy ridge, Moraballi Creek, Essequibo River, Nov. 11th, 1929 (fully mature buds), *Sandwith* 596 (type); *ibid.*, in greenheart forest, Oct. 19th, *Sandwith* 489; *ibid.*, in mora-morabukea forest, August 16th (leaves and young shoots only), *Sandwith* 32; opposite Bartica, Essequibo River, April 1887 (flowers and fruit), *Jenman* 3880; Kalakoon, Nov. 1886 (leaf only), *Jenman* 2562; Upper Demerara River, Sept. 1887 (open flowers), *Jenman* 4228; Upper Kamuni River, Demerara River, Dec. 1908 (open flowers), *C. W. Anderson* 153 in part.

Vernacular names: Warunanna (Arawak); Bush Orange; Powis' Tail Tree.

This is one of the most striking and easily recognised trees found in British Guiana. Individuals were scattered through all the types of forest studied by the Moraballi Creek. The tree from which the type material was collected was 102 feet high and 10 inches in diameter, while another example felled (no. 489) was 97 feet high and 15 inches in diameter. The inflorescence, as described above, forms an enormous flat-topped compound thyrse enclosed by the leaf-rosette. The pedicels and calyx are pinkish-brown, the mature buds a beautiful rose-pink, the filaments flesh-white, the ovary green with pinkish-purple styles. The fruit, according to Jenman and the Arawaks, is yellow, juicy and edible, about as large as a lime. Ducke gives no description of the mature floral parts of his *D. excelsa*, but the leaf of his no. 10518 in Herb. Kew. is immediately distinguished by its much greater width and by the conspicuous indumentum of the lower surface.

Burseraceae.

Trattinickia demerarae *Sandwith*, sp. nov.; inflorescentia *T. rhoifoliam* Willd. simulans, foliolis 3–5-jugis angustioribus utrinque laevibus nec asperulis prominentius reticulatis basi rotundatis vel obtusis neque cordatis differt.

Arbor gummifera excelsa, circiter 39 m. alta, 80 cm. diametro, cortice laevi cinereo; ramuli summi floriferi cinerei, nitidi, punctis elevatis obtecti, ceterum glabrati, laeves, leviter sulcati. *Folia* 20–30 cm. longa, imparipinnata, petiolo supra applanato subtus tereti minute pubescente mox glabrato cinereo 5–10 cm. longo, internodiis glabratis cicatricibus gummae notatis 2–3 cm. longis; petioluli transverse rugosi, corrugati, glabri, 4–7 (vulgo 5) mm. longi; foliola 3–5-juga, vulgo opposita, lanceolata, oblongo-lanceolata, vel ovato-lanceolata, apice sensim conspicue 1–2 cm. acute acuminata, basi plerumque rotundata nonnunquam obtuse cuneata, 6–13 cm.

longa, 2–4 cm. lata, coriacea, supra nitida punctis minutis elevatis obtecta sed laevia nec asperula, subtus punctata glabra laevia, utrinque praesertim subtus reticulata venulis intricatis manifestis elevatis, nervis primariis utroque costae latere circiter 16–25 parallelis usque ad furcam vulgo rectis a se 3–8 mm. distantibus. *Inflorescentia* laete pyramidalis, 15–25 cm. longa, basi 12–25 cm. lata, ramis subparallelis rectis vulgo (praesertim inferioribus) horizontalibus striatis pilis griseo-fulvis dense tomentellis. *Flores* pallide roseo-brunnei, ut in *T. rhoifolia* per ramos in ramulis abbreviatis densissime congesti ; fasciculi florum globosi, 0·5–2 cm. diametro ; pedicelli dense tomentelli, brevissimi, subnulli vel vix ad 1·5 mm. longi ; bracteae bracteolaeque ut in *T. rhoifolia* in compluribus seriebus, conspicuae, caducae, brunnescentes. *Calycis* tubus campanulatus, inaequaliter fissus, 2–2·5 mm. longus, 2–3 mm. latus, utrinque griseo-tomentellus ; dentes triangulari-ovati, obtusi, 1·5–2 mm. longi, 2–2·5 mm. lati, utrinque tomentelli. *Corollae* tubus cylindricus, 4–4·5 mm. longus, ad 2·75 mm. latus, extra basi excepta dense griseo-tomentellus, intus nisi sub lobis glaber ; lobi triangulari-ovati, obtusi, primo erecti, denique patuli, 1·5 mm. longi atque lati, extra griseo-tomentelli, intus sparsius pilosuli. *Antherae* 1·3 mm. longae, ad 0·75 mm. latae ; filamenta brevissima. *Ovarium* glabrum, nigrescens, circiter 1·2 mm. diametro, 1 mm. altum, in stylum glabrum circiter 1 mm. longum transiens. *Drupa* siccitate nigra, ovoideo-subglobosa, ad 1 cm. diametro.

British Guiana. Yarikita River, North-west District, April 13th, 1929, *Forestry Department* record no. 915 (type). "Very plentiful in mixed forest (dominants, Black Kakaralli and Haiariballi) on hill slope, on brown sand overlying ochreous-yellow clay. Large tree, slightly buttressed, 127 ft. high, 70 ft. to the first branch, 32 in. in diameter. Bark smooth, grey, moderately thick, yellowish when blazed. Tree has an aromatic gum like Haiowa gum, and is one of the Bastard Haiowas."

Moraballi Creek, Essequibo River, November 1929 (leaf only), *Sandwith* 708. Tall tree with straight smooth trunk, in morabukea-mixed forest, used as an observation-post by members of the Oxford Expedition.

Vernacular name (Arawak), Ulu.

Celastraceae.

Maytenus myrsinoides *Reiss.* in Mart. Fl. Bras. xi. pars i. 21 (1861).

Moraballi Creek, Essequibo River, Oct. 3rd, 1929, *Sandwith* 369. Tall tree, 97 ft. high, 18 in. diam., in mixed forest. Flowers very small, with greenish-white petals.

Vernacular name (Arawak), Kaiarima.

Distr. Surinam, French Guiana.

It is hoped that more and better flowering material of this tree will be collected, for the confirmation of this identification.

Salacia podostemma *Sandwith*, sp. nov. ; *S. cognatae* (Miers) Peyr. affinis, inflorescentiis dichotome ramosis, pedunculo primario multo longiore, ramis omnibus gracilibus, pedicellis cymarum summarum distinctis nec capitellatim aggregatis differt.

Frutex alte scandens, ramulis ultimis glabris purpureis leviter sulcatis subteretibus 2–4 mm. diametro ; internodia 4–7 cm. longa. *Folia* elliptica vel ovata, apice breviter 0·3–1 cm. cuspidata, nonnunquam rotundata vel emarginata, basi in petiolum abrupte cuneata, 8–18·5 cm. longa, 5–8·5 cm. lata, juniora chartacea utrinque nitida, adulta subcoriacea opaca, glabra, margine integro vel obsolete obscure crenato, juniora utrinque valde reticulata praesertim supra rete venularum subtilissimo, adulta supra nervis primariis impressis obscuris secundariis venulisque fere omnino immersis saepius haud distinguendis, subtus primariis secundariisque paullo elevatis sed venulis impressis, nervis primariis utroque costae latere 10–15 valde arcuatis ; petiolus glaber, 1–1·6 cm. longus. *Inflorescentiae* solitariae, axillares, oppositae, nonnunquam in axillis cataphyllorum ovatorum vel ovato-lanceolatorum 2·5–6 mm. longorum 2–3 mm. latorum repertae, 5–10 cm. longae, pedunculo communi 3–5 cm. longo, tum repetite dichotomo-ramosae, apice cymis floriferis corymbosis 2–4 cm. latae ; pedunculus ramique glabri, siccitate pruinoso-purpurascentes, graciles, flexuosi ; bracteae bracteolaeque ovatae, concavae, 0·5–2 mm. longae, circiter ad 1·5 mm. latae. *Flores* albo-virides, satis laxe dispositi nec capitellatim aggregati ; pedicelli distincti, parce verruculosi, 1–2 mm. longi. *Sepala* ovata, glabra, extra parce verruculosa, fimbriata, 0·75 mm. longa, 1 mm. lata. *Petala* rotundato-obovata, glabra, minute fimbriata, inaequalia, 1·5–2·25 mm. longa, 1·25–1·75 mm. lata. *Stamina* circiter 0·6 mm. longa, in cavitatibus disci ovariique lateralibus conspicuis suberecta. *Ovarium* cum disco confluens, 1 mm. altum atque diametro, subglobosum, glabrum, lateraliter profunde tri-excavatum, vertice late rotundato-subumbilicato ; stigmata 3, ovarii vertici horizontaliter adnata, tum ultra paullum producta, staminibus opposita, 0·5 mm. longa. *Fructus* non visus.

BRITISH GUIANA. Moraballi Creek, Essequibo River, August 24th, 1929, *Sandwith* 108. Bush-rope in mixed forest. Flowers whitish-green.

SAPINDACEAE.

Talisia squarrosa *Radlk.* in Sitz. Math.-Phys. Akad. Muench. viii. 346 (1878).

This fine tree, characteristic of wallaba forest, has very rarely been collected. The following agree with the type material (*Schomburgk* 736) : Moraballi Creek, Essequibo River, Sept.-Oct. 1929, *Sandwith* 333, 357, 490 ; a large tree with silvery-grey bark. Mora-mora-bisi Creek, Mapenna River, Corentyne River, May 1918, *Hohenkerk* in Forestry Department record no. 715.

Vernacular name (Arawak), Moroballi.

Matayba inelegans *Radlk.* in Sitzb. Math.-Phys. Acad. Muench. ix. 627 (1879).

In wallaba forest on dry soil by the Moraballi Creek, Essequibo River, Aug.-Oct. 1929, *Sandwith* 95, 96, 536. A low tree 25–30 ft. high, with white flowers and bright scarlet fruit.

Distr. British Guiana, Amazonian Venezuela.

M. opaca *Radlk.* l.c. 628.

In wallaba forest on high ground near the Moraballi Creek, Essequibo River, Sept.-Nov. 1929, *Sandwith* 330 and 566. A middle-sized tree, no. 566 being 70 ft. high and 9 in. in diameter. Other British Guiana collections are *Jenman* 4237 and 4269 (Upper Demerara River, Sept. 1887); *Jenman* 4330 (Lower Demerara River, Jan. 1888); *Jenman* 6860 and 6878 (Demerara River, Jan. 1896); *Hitchcock* 17304 (Rockstone, Dec. 1919—Jan. 1920).

Vernacular name (Arawak), Red Kuleshiri.

Distr. British Guiana, Surinam, Amazonian Brazil.

CONNARACEAE.

Rourea surinamensis *Miq.* in Linnaea xxvi. 221 (1853).

Moraballi Creek, Essequibo River, Sept. 7th, 1929, *Sandwith* 183; bush-rope in mixed forest. Canje River, April 1884, *Jenman* 1822.

Distr. West Indies, Guiana.

XXVIII.—TWO RUTACEAE FROM QUEENSLAND AND NEW GUINEA.

W. D. FRANCIS.

A package of *Evodia* from Queensland and Papua (British New Guinea) was recently transmitted from the Queensland Herbarium to Kew for identification. The specimens collected in Queensland were labelled *Evodia accedens* Blume. After examining the collections at Kew, Berlin and Leiden I came to the conclusion that the Queensland material from the Queensland Herbarium, labelled *Evodia accedens* Blume, was not that species, but *Evodia Elleryana* F. Muell.

At Leiden I had the opportunity of examining a large series of specimens labelled by Blume as *Evodia accedens*. The botanists of the Rijks Herbarium kindly assisted me with their advice and experience. Unfortunately it was not possible to come to a decision as to which specimens constituted Blume's type of this species. However, the characters of *E. accedens* could be inferred from the many specimens written up in Blume's handwriting. It is evident that *E. accedens* Blume, which is a native of Java, is a large-leaved species with large panicles (at least twice the length of those of *E. Elleryana* F. Muell.) and small flowers (less than half the size of those of *E. Elleryana*).

Most of the Papuan specimens in the package from the Queensland Herbarium were also found to be *Evodia Elleryana*.

Two varieties of *E. Elleryana* are recognized by the writer, namely var. *pilosa* (Lauterb.) and var. *tetragona* (K. Schum.).

The latter was described by K. Schumann as a new species, *Evodia tetragona*, but hardly differs from typical *E. Elleryana* except in having a glabrous style. The former, which coincides with typical *E. Elleryana*, was published by Lauterbach as a variety *pilosa* of *E. tetragona*. It has a pilose style.

The synonymy of the two varieties is as follows :—

Evodia Elleryana *F. Muell.* Fragm. Phytogr. Austr. v. 4 (1865-1866).

1. var. **pilosa** (*Lauterb.*).
Evodia tetragona K. Schum. var. *pilosa* Lauterb. in Lorentz Nova Guinea, xiv. 140 (1924).

2. var. **tetragona** (*K. Schum.*).
Evodia tetragona K. Schum. Fl. Kaiser Wilhelms Land, 57 (1889).

The variety *pilosa* includes all specimens of the species collected in Queensland. It ranges from Stradbroke Island near Brisbane in the South to Bellenden-Ker Range near Cairns in the North. It also occurs in New Guinea.

The variety *tetragona* is evidently very common in New Guinea, as there is a large series of specimens from that island in the Herbarium of the Botanic Gardens, Berlin.

Another species of Rutaceae from Eastern Australia was distributed by F. Mueller as *Evodia accedens* Blume. Specimens of it from Mueller are in the Herbaria at Kew and Berlin and in the Rijks Herbarium, Leiden. Engler, recognising that the species was different from Blume's *accedens*, named it *Evodia Muelleri* in Engler & Prantl, Pflanzenfamilien iii. 4, 121 (1896). The specimens at Kew are labelled in exactly the same way as those at Berlin, and the same two species are concerned. The label in each instance reads : "*Evodia accedens* Blume, Rockingham Bay, Dall(achy)." In both cases a capsule contains the cocci of an *Evodia*. One of the branchlets of the Kew specimens bears both flowers and fruit. The fruits are very different from those in the capsule and show that the species is not an *Evodia* but an *Acronychia*. The flowers on the Berlin specimens match those on the Kew specimens. The cocci in the capsules accompanying the Kew and Berlin specimens match those of *Evodia Elleryana* F. Muell. var. *pilosa* (*E. tetragona* K. Schum. var. *pilosa* Lauterb.).

As well as I can remember the specimens from Mueller in the Rijks Herbarium, Leiden, bear a label similar to those of the specimens at Kew and Berlin. In this instance, however, I believe the fruits in the accompanying capsule match those which are *in situ* on the Kew branchlet.

In accordance with the observations outlined above I propose to transfer *E. Muelleri* Engl. to *Acronychia*, as it evidently belongs to the tetrastemonous section of that genus.

It should be pointed out that *Evodia Muelleri* is illustrated in the Pflanzenfamilien iii. 4, 120, by Fig. 67, G,H,J. According to my conclusions, J represents the fruit of *Evodia Elleryana* F.

Muell., and G and H the flowers of *Acronychia Muelleri* comb. nov. Obviously the confusion has arisen through the collector, or the person who transmitted the specimens, mixing parts of two species.

According to his remarks, Lauterbach (Engl. Bot. Jahrb. lv. 234, 1919; Nova Guinea, xiv. 140, 1924) evidently considered *Evodia Muelleri* Engl. and *E. tetragona* K. Sch. as very closely allied or probably identical species. On first viewing the types of the two species I formed a similar opinion of their relationship. After a further examination of the material in the Kew Herbarium as well as of that in the Herbarium of the Botanic Garden, Berlin, I found that there were considerable differences as under :—

Evodia Elleryana *F. Muell.* (*E. tetragona* K. Sch.)	**Acronychia Muelleri** (*Engl.*) comb. nov. (*Evodia Muelleri* Engl.)
Leaflets mostly elliptical, acuminate.	Leaflets mostly lanceolate, long-acuminate.
Filaments of stamens glabrous.	Filaments of stamens pubescent in lower part.
Anthers oblong, with a distinct sinus between the thecae at the apex.	Anthers ovate, the apex without a sinus between the thecae.
Disk of flower very large, conspicuous, 4-lobed and densely fulvous-pubescent.	Disk of flower almost imperceptible.
Ovary deeply 4-lobed, finely pubescent.	Ovary entire, hyper-hemispheric, densely fulvous-pubescent.
Fruits of 1–4 separate cocci.	Fruit pyriform, fulvous-pubescent, slightly 4- or 8-lobed.

A comparison of Fig. 67, G and H, in the Pflanzenfamilien iii. 4, 120 (1896) with Fig. 1 in Engler's Bot. Jahrb. lv. 235 (1919) will demonstrate some of the points of difference outlined above.

From the characters given, it is evident that *Evodia Muelleri* differs from *E. Elleryana* not only specifically but also generically. Because of the confusion associated with this species a description of it is appended.

Acronychia Muelleri (*Engl.*) *W. D. Francis*, comb. nov.

Apparently a *tree*. Glabrous throughout except the inflorescence and fruit. *Branchlets* terete, 3·5 mm. in diameter 14 cm. from the apex. *Leaves* opposite, 3-foliolate; petioles 3–6 cm. long; leaflets lanceolate, apex long acuminate, blade finely decurrent into the petiolule, with 10–12 principal lateral nerves visible on both sides of midrib; blades 7–13 cm. long [about 3 times as long as broad]. *Inflorescence* just above the scars of fallen leaves, 2–3 cm. long; the common peduncle 7–12 mm. long, bearing 3–6 flowers at its apex and sometimes 1–4 flowers lower down; or at times the common peduncle bears one or a few cymes of 3 flowers each pedicels

3–5 mm. long. *Calyx* disc-shaped or concave, 3–4 mm. diameter, divided almost to the base into 4 imbricate, orbicular lobes 1·5–2 mm. in diameter. *Petals* 4, ovate or elliptic, punctate outside, fulvous-pubescent inside, 5–6 mm. long, 3 mm. broad. *Stamens* 4; filaments filiform, or slightly flattened below, pubescent towards the base, 10–12 mm. long; anthers attached near middle of their back, ovate or cordate, 2 mm. long, 1 mm. broad. *Disc* inconspicuous or wanting. *Ovary* hyper-hemispheric, very densely fulvous-pubescent; style slender, pilose in lower part. *Fruit* pyriform, fulvous-pubescent, slightly 4- or 8-lobed, wrinkled and reticulate outside in the dry state, 12–14 mm. long and about 10 mm. in diameter.

QUEENSLAND. Rockingham Bay, *Dallachy*.

PAPUA. Borabere, 1000 ft., 30.11.1925, *Brass* 728.

Brass describes the species as an erect sparsely-branched tree, 20–25 ft. high, with a close light-brown bark; flowers pink, borne on branches below the leaves or on the main branches.

XXIX.—NOTES UPON SOUTH AFRICAN PLANTS.

N. E. BROWN.

I. Iridaceae.

Aristea torulosa *Klatt*.

Through the courtesy of Dr. L. Diels, the Director of the Botanical Garden and Museum, Berlin, I have had the opportunity of examining the specimens upon which Klatt founded *Aristea torulosa* and find, as I had expected, that they are quite distinct not only from the plant described by Baker (in Dyer, Fl. Cap. vi. 49) under the name *Aristea torulosa*, but also from any specimens in the Kew Herbarium.

Klatt (Ergänz. 48) founded *A. torulosa* upon two specimens collected by Drège, numbered 4558 and 4559 respectively. Upon examination, I find that these two specimens represent two distinct but allied species. The general description given by Klatt applies equally well to both specimens, but the characters "caulis 2-pedalis" and "ramis brevibus alternantibus" apply only to the specimen numbered 4558, and as this is also the first number quoted for the species by Klatt it may be considered to be the type of *A. torulosa*. A revised description of the species is now supplied.

Aristea torulosa *Klatt*, emend. *N. E. Brown*.

Stem (broken away from the basal part) 56 cm. high, probably 60 cm. or more when alive, 4 mm. thick, compressed and slightly 2-edged (not triangular as described by Klatt), bearing two leaves (besides three at its base) and 4 sheaths. *Leaves* 20–30 cm. long, one being 3 mm. broad and the remainder 5·5–7·5 mm. broad (not 2 lines—4 mm.—as stated by Klatt). *Inflorescence* 10 cm. long, with four internodes 8–30 mm. long; each node bears an ascending branch with 1–3 flower-clusters upon it (the alternating branches of Klatt's description) and one sessile cluster in its axil; the uppermost branch is 8 mm. long and the lowest 4·5 cm. long. *Flower-clusters* as

dried, with flowers all shrivelled, 8–10 mm. in diameter ; the outer or cluster-bract with more than half its area firm and brown (or perhaps green when alive) and the margins membranous, lacerate ; inner bracts membranous, much lacerate, whitish. *Flowers* not dissectable, their twisted remains about 6 mm. long.

Cape Province. Kentani or Willowvale Division, between Kei (Gekau of Drège) River and Bashee River, *Drège* 4558.

Aristea congesta *N. E. Brown*, sp. nov.

Planta similis *A. torulosae* Klatt sed tantum 32·5 cm. alta. *Folia* 20–28 cm. longa, 6–9 cm. lata, linearia, acuta, inferiora curvata. *Spica* 5 cm. longa, densa, internodiis indistinctis, basi tantum sub-biramosa, e capitulis globosis 12 mm. diametro composita. *Perianthii* reliquiae 6–9 mm. longae.

Plant, including rhizome, 32·5 cm. high, with about 3 basal leaves (two of them much curved), 20–28 cm. long and 6–9 mm. broad, linear, acute, and 3 reduced leaves and 1 sheath on the compressed and faintly 2-edged stem. *Inflorescence* 5 cm. long, composed of two short basal branches and about 8 sessile densely crowded flower-clusters, 12 mm. in diameter, without apparent internodes between them. Outer *bracts* with broader membranous margins than in *A. torulosa*, and, together with the whitish membranous inner bracts, much lacerated. *Flowers* not dissectable, their twisted remains 6–9 mm. long.—*A. torulosa* Klatt, Ergänz. 48 (1882), pro minore parte.

Cape Province. Pondoland : between Umsikaba River and Umtentu River, *Drège* 4559.

For the plant actually described by Baker in Flora Capensis as *A. torulosa* I propose the name *Aristea Woodii*.

Aristea Woodii *N. E. Brown*, nom. nov.—*A. torulosa* Baker in Dyer, Fl. Cap. vi. 49 (1896), quoad descr., non Klatt.

Natal. Inanda, *Wood* 751 (type) ; Clairmont, *Wood* 206 ; without locality, *Krauss*.

Under *A. torulosa*, Baker also included the following species :—

Aristea affinis *N. E. Brown*, sp. nov.

Planta 50–76 cm. alta. *Caules* basi 2·5–4 mm. crassi. *Folia* 15–30 cm. longa, 4–8 mm. lata, linearia, acuta. *Inflorescentia* 10–20 cm. longa, internodiis 0·8–3·6 cm. longis, inferne 2–3 ramulis brevibus, superne simplex. *Capitula* 6–10 mm. diametro. *Perianthii* reliquiae 9–12 mm. longae.

Plant 50–76 cm. high with about 4 basal leaves 15–30 cm. long and 4–6 mm. broad, straight, linear, acute, and about 3 reduced leaves and 3 sheaths on the slightly compressed stem, which is about 4 mm. thick at the base. *Inflorescence* 10–20 cm. long with 4–8 nodes, and the internodes 0·8–3·6 cm. long, the lower 1–3 nodes producing short ascending branches bearing 2–4 flower-clusters, and

the upper nodes all with sessile clusters, 6–10 mm. in diameter. *Flowers* pale blue, their remains 9–12 mm. long.

TRANSVAAL. Near Barberton, on grassy mountain slopes at Upper Moodies, *Galpin* 1209.

Aristea curvata *N. E. Brown*, sp. nov.; similis *A. affini* N. E. Brown quoad caulem et inflorescentiam, sed foliis valde falcato-recurvatis 15–18 cm. longis et 7–8 mm. latis differt.

In height and inflorescence this plant is very like *A. affinis* N. E. Brown in the dried state, but differs conspicuously in its foliage; the basal leaves are only 15–18 cm. long, 7–8 mm. broad, and are strongly falcately recurved, and the free tips of the stem-sheaths are 2–3 cm. long and 4–5 mm. broad. There also seem to be indications that *A. curvata* is a more glaucous plant than *A. affinis*, but this may be due to drying. The flowers of neither species are dissectable and cannot therefore be compared.

TRANSVAAL. Pietersburg Division: Houtbosch, *Rehmann* 5770.

Aristea gracilis *N. E. Brown*, sp. nov.

Planta 30–38 cm. alta. *Caules* graciles, basi 1·5–2 mm. crassi *Folia* 9–20 cm. longa, 3–5 mm. lata, leviter curvata, linearia, acuta; caulium vaginae arcte convolutae. *Spica* 2·5–8 cm. longa, simplex. *Capitula* 3–5, sessilia, 4–8 mm. diametro, bractearum marginibus albidis. *Perianthii* lobi circiter 7 mm. longi, 3–4 mm. lati, obovati, apice obtuse rotundati, caerulei.—*A. torulosa* var. *monostachya* Baker in Dyer, Fl. Cap. vi. 49 (1896).

TRANSVAAL. Lydenburg Division: Spitzkop Goldmine, *Wilms* 1420 (type).

NATAL, without precise locality, *Buchanan*.

Watsonia Ardernei *Mathews et L. Bolus* in Ann. Bolus Herb. iv. 25 (1925).

This appeared as a new species, but the name *Watsonia Ardernei* was effectively published twenty-eight years earlier, the correct reference being to Sander, New Plants, 1897, pp. 19-21, with figure.

The account given by Sander can hardly be regarded as a technical description, and the illustration cannot be accepted as equivalent to a description, since it does not contain analyses. The name *Watsonia Ardernei* Sander was, however, validated by the citation, as a synonym, of *Watsonia iridifolia* var. *O'Brieni* N. E. Brown, which had been published with a description in Gard. Chron. 1889, vi. 350.

The history of this handsome plant appears to be as follows:— There is a specimen of it in Thunberg's Herbarium, collected by Thunberg between 1772 and 1775 (see Journ. Linn. Soc., Bot. xlviii. 26), so that he must be credited with the discovery of this beautiful species. No other collector appears to have found it until 1889, when it was introduced into cultivation and described by the writer

as *W. iridifolia* var. *O'Brieni* N. E. Brown, and eight years later was published as a distinct species by Sander.

Watsonia juncifolia *Baker*, Handb. Irid. 178 (1892).

Although placed under *Watsonia*, this plant cannot belong to that genus, as the perianth-tube is very slender and not at all widened from or below the middle to the throat as it is in *Watsonia*, and the stamens are inserted at the throat instead of at the middle of the tube. As the above characters are those that distinguish *Lapeyrousia* from *Watsonia*, this plant must be transferred to the former genus. I therefore propose for it the name **Lapeyrousia juncifolia** (*Baker*) *N. E. Brown*, comb. nov.

Watsonia densiflora *Baker* in Journ. Bot. 1876, 336.

This species was founded upon Drège 4536, Plant 29, Cooper 3186, Cooper 886, and a specimen collected by Miss Armstrong, without a number. As these quoted specimens represent several different species, a type for *W. densiflora* has to be selected from among them; therefore, as the original description seems to have been drawn up chiefly if not entirely from Drège 4536, and as that is the first specimen quoted by Baker, I propose that it should be accepted as the type of *W. densiflora* Baker. Drège collected it in Pondoland, between St. John's River and Umtata River.

For the other specimens I propose the following names :—

Watsonia Plantii *N. E. Brown*, sp. nov.; planta *W. densiflorae* Baker simillima, sed internodiis inter flores distinctis, bracteis 3 cm. (nec 2·5 cm.) longis, perianthio 5–5·5 cm. longo segmentis 5 mm. (nec 7 mm.) latis et brevissime apiculatis differt.

Natal. Near Durban, *Plant* 29.

In 1878 a plant collected by Mr. C. Mudd in Natal was figured in Bot. Mag. t. 6400 as being *W. densiflora* Baker. But this plant differs from *W. densiflora* (as to Drège 4536) by having narrower leaves, narrower and more acuminate bracts, displaying the internodes of the spike between the flowers, and narrower perianth lobes. No specimen of this plant appears to have been preserved, but the figure of the inflorescence as depicted in Bot. Mag. t. 6400 agrees so exactly with that of Plant 29, that I believe it to represent the same species. Unfortunately Plant's specimen is destitute of leaves, so that those organs cannot be compared with the figure.

Watsonia lepida *N. E. Brown*, sp. nov.

Planta circiter 60–70 cm. alta, foliosa, glabra. *Folia* 7–15 cm. longa, 4–8 mm. lata, linearia, acuta, marginibus incrassatis. *Spica* 11–17 cm. longa, 14–16-flora, internodiis inter flores distinctis ad 10 mm. longis. *Bracteae* 2–3 cm. longae, 4–6 mm. e margine ad carinam latae, acuminatae. *Perianthii* tubus 3–4 cm. longus, ad medium curvatus et superne inflatus; lobi 2–2·3 cm. longi, 7–8 mm.

lati, lanceolati, oblongi, acuti, apiculati, pallide rosei. *Stamina* e tubo perianthii 2–3 mm. exserta.

Orange Free State. In the vicinity of Harrismith, *Cooper* 886.

Watsonia neglecta *N. E. Brown*, sp. nov.

Planta circiter 90 cm. alta, glabra. *Folia* ad vel ultra 45 cm. longa, 5–8 mm. lata, linearia, marginibus incrassatis. *Spica* circiter 20 cm. longa, 30-flora, partibus internodiorum inter bracteas conspicuis 2–5 mm. longis. *Bracteae* 16–18 mm. longae, 5 mm. e margine ad carinam latae, subobtusae vel breviter acutae. *Perianthii* tubus circiter 3 cm. longus, subrectus vel vix curvatus, supra medium dilatatus; lobi 14–16 mm. longi, 7 mm. lati, oblongi, breviter acuti, apiculati.

Natal, *Cooper* 3186.

The apical part of all the leaves on the specimen seen has been cut off, and the longest of them is 39 cm. long, but has evidently been very much longer. The colour of the flower is not stated by the collector, who could not localise his specimens, as the places where he collected during his journey were unnamed at that date, about 1861.

Morea obtusa *N. E. Brown*, sp. nov.; *M. angustae* Ker simillima sed humilior, floribus multo minoribus, segmentis exterioribus lilacinis vel violaceis.

Bulbus globosus, 1·2 cm. diametro, tunicis in segmenta linearilanceolata imbricata sectis nigro-fuscis. *Caulis* 15–30 cm. altus, simplex, unifoliatus. *Folium* 20–40 cm. longum, 0·7–1·3 mm. crassum, teres, glabrum. *Bracteae* tres, superiores 3–4 cm. longae, omnes apice truncato-rotundatae, virides, saepe purpureo-marginatae. *Perianthium* circiter 4·5 cm. diametro, segmentis lilacinis vel violaceis, exterioribus unguibus 1·2 cm. longis et limbis 1·8 cm. longis et 8 mm. latis, interioribus circiter 1·8 cm. longis et 3 mm. latis. *Antherae* croceae vel aurantiacae. *Styli* ramorum cristae 1·2–1·4 cm. longae, acute bilobae, albae.

Cape Province. Cape Division: in a marsh at Crawford, Cape Flats, *Weintroub in Herb. Moss* 18185 (type); Wynberg, *Prior*; Simon's Bay, *Wright*; Devil's Mountain, *Scott Elliott*; between Constantia Nek and Hout Bay, *Wolley Dod* 3268; near Camps Bay Toll, *Wolley Dod* 1358.

This plant has hitherto been confused with *M. angusta* Ker, but is readily distinguished by its smaller size and differently coloured flowers, those of *M. angusta* being pale yellow or creamy-yellow and much larger than those of *M. obtusa*. Both these species are distinguished from the other species of the genus by the truncately rounded tips of the bracts.

II. Liliaceae.

Bulbine lagopus (*Thunb.*) *N. E. Brown*, comb. nov.

Baker cited *Anthericum lagopus* Thunb. as a synonym of *Bulbine longiscapa* Willd., in Dyer, Fl. Cap. vi. 363, but although

allied to that species *A. lagopus* differs conspicuously by having shorter and blunter leaves and entire bracts; in *B. longiscapa* the bracts are somewhat woolly-ciliate at the base. I therefore separate Thunberg's plant under the above name. Thunberg does not mention where it was collected, but a plant collected on Table Mountain (*Rogers* 17728) appears to be this species, which is remarkable for the manner in which the pedicels from which the unfertile flowers have fallen recurve or are revolute.

Bulbine Zeyheri *Baker.*

This species was founded in Journ. Linn. Soc. Bot. xv. 347, upon specimens collected by Zeyher bearing the numbers 4219 and 4224. But as these numbers represent two distinct species, one of them has to be renamed. As the specimens bearing the number 4219 are evidently those from which the description was chiefly made, since they best conform to it, and that number is the one first quoted by Baker, it (No. 4219) should be taken as the type of *B. Zeyheri*, which according to one label at Kew was collected in Worcester district. A new name, *B. inops*, is now given to the other number.

Bulbine inops *N. E. Brown*, sp. nov.

Acaulis, tuberosa, 15–17·5 cm. alta. *Folia* 3–4, erecta, 5–9 cm. longa, 2–3 mm. lata (siccata), attenuata, acuta, glabra. *Scapus* 7·5–10 cm. longus, 1–1·5 mm. crassus. *Racemi* 5–9 cm. longi, 6–12-flori. *Bracteae* 2 mm. longae, ovatae, mucronatae, pallide brunneae. *Pedicelli* ascendentes vel suberecti, 6–8 mm. longi. *Perianthium* 5 mm. longum, segmentis vix 1·5 mm. latis. *Capsula* 4 mm. longa.

Cape Province. Swellendam Division: Hassaquas Kloof, near the Zonder Emde River, *Zeyher* 4224.

III. Orchidaceae.

Eulophia robusta *Rolfe.*

This species was founded in *Kew Bull.* 1910, 369, upon a specimen collected near Heidelberg, in the Transvaal, "*McLea in Herb. Bolus* 5818." In Dyer, Fl. Cap. v. part 3, 35, a large number of other localities are quoted for the species. Upon examination, however, I find that two distinct species have been confused, for No. 5818 of Herb. Bolus is identical with *E. Cooperi* Reichb. f., while the other specimens confused with it are the same as *E. Bakeri* Rolfe, which was founded upon a leaf and one flower only. I find too that *E. fragrans* Schlechter and *E. Sankeyi* Rolfe are also identical with *E. Cooperi* Reichb. f., although placed in a different part of the key. The following therefore will be the synonymy of the above species:—

Eulophia Cooperi *Reichb. f.* in Flora, lxiv. 330 (1881).—*E. fragrans* Schlechter in Engl. Bot. Jahrb. xx. Beibl. 50, 27 (1895). *E. robusta*

Rolfe in Kew Bull. 1910, 369. *E. Sankeyi* Rolfe in Dyer, Fl. Cap. v. pt. 3, 46 (1912).

The types of *E. Cooperi* and *E. Sankeyi* are both from Harrismith, and the types of *E. fragrans* and *E. robusta* are both from Heidelberg.

It may be of interest to those who have sets of Cooper's plants to know that all his specimens noted as having been collected in the Orange Free State were obtained in the vicinity of Harrismith or upon or near Nelson's Kop, as Mr. Cooper informed the writer that he collected in no other part of the Orange Free State.

Eulophia Bakeri *Rolfe.*—*E. robusta* Rolfe in Dyer, Fl. Cap. v. pt. 3, 35, as to specimens quoted, excluding *McLea in Herb. Bolus* 5818, not as to Kew Bull. 1910, 369.

The above two species may be distinguished as follows :—

Leaves 5–15 cm. long ; sheaths on the flowering stem about 8–9 mm. in diameter as they grow on the stem, which they loosely surround, open at the top ; lip of flower with 4–5 rows of papillae or small tubercles which towards the tip of the lip sometimes change into a few filiform processes.....*E. Cooperi.*

Leaves 13–32 cm. long ; sheaths on the flowering stem 4–6 mm. in diameter and rather closely embracing the stem ; lip of flower with 4–5 rows of small tubercles on the basal part, which change into numerous filiform processes or crests on the front part.....*E. Bakeri.*

IV. Ficoidaceae.

Mesembryanthemum lunulatum *Berger.*

Having examined the type of this species, I find it to be identical with *M. Frederici* L. Bolus and that *M. argenteum* L. Bolus is also conspecific, therefore the synonymy of the species is :—

Mesembryanthemum Frederici *L. Bolus* in Ann. Bolus Herb. ii. 31 (1916).—*M. lunulatum* Berger in Engl. Bot. Jahrb. lvii. 638 (1922). *M. argenteum* L. Bolus in Ann. Bolus Herb. iv. 8 (1925).

Mesembryanthemum squalidum *N. E. Brown.*

This is the plant figured and described in Flowering Plants of South Africa, vii. t. 277, under the name of *Ruschia cymbifolia* L. Bolus, and there supposed to be the same as *Mesembryanthemum cymbifolium* Haw. But it differs from the latter species by its mode of branching, smaller and different leaves, longer pedicels and smaller flowers, and is from a different locality. I have therefore changed the name as above. With reference to the genus *Ruschia*, this does not differ structurally in any way from *M. umbellatum* Linn., which I selected for the type of *Mesembryanthemum* when I restricted and emended that genus, and it must therefore be treated as a synonym of *Mesembryanthemum.*

XXX.—SUGGESTED CONSERVATION OF POLLICHIA.

C. A. Smith.

The generic name *Pollichia* Dryand. in Ait. Hort. Kew. ed. 1, i. 5 (1789) has been used in standard works for over 140 years for a monotypic African genus of *Caryophyllaceae* (*Illecebraceae*). Under International Rules, ed. 2, Art. 56, it was the correct name for this genus, since the prior homonym *Pollichia* Schrank (1782) was a superfluous name for *Galeobdolon* Adans. (1763), and *Pollichia* Medic. (1783) is a *nomen rejiciendum* in respect of *Trichodesma* R. Br., of which it is a nomenclatural synonym.

At the Fifth International Botanical Congress held at Cambridge in August, 1930, however, a rule was proposed rejecting all later homonyms, except such as are or may be conserved, and was passed on the understanding that any well-known generic names invalidated by it would be considered for conservation. A case for the conservation of *Pollichia* Dryand. is accordingly presented for consideration by the appropriate International Committee. The running number prefixed to the name is that of Dalla Torre & Harms, Genera Siphonogamarum.

2467. **Pollichia** *Dryand.* in Ait. Hort. Kew. ed. 1, i. 5 (1789): versus *Meerburgia* Moench (1802).

Pollichia Dryand. would under the revised Rules be superseded by *Neckeria* Gmel. (Syst. 16: 1791), but for the fact that the latter is in its turn invalidated by the earlier homonym *Neckeria* Scop. (1777). Thus the next oldest name, *Meerburgia* Moench (Meth., Suppl. 116: 1802), must now be used in place of *Pollichia* Dryand., unless the latter is conserved. *Meerburgia* Moench has, however, apparently not been used for nearly 130 years, i.e., since the date of its publication. *Pollichia* Dryand., on the other hand, has been adopted in Ait. Hort. Kew. ed. 1, i. 5 (1789); Schreb. Gen. ii. 782 (1791); Willd. Sp. Pl. i. 23 (1798); Pers. Syn. i. 4 (1805); Ait. Hort. Kew. ed. 2, i. 11 (1810); Roem. & Schult. Syst. Veg. i. 17 (1823); DC. Prodr. iii. 377 (1839); Harv. Gen. S. Afr. Pl. ed. 1, 112 (1838); Endl. Gen. 959 (1839); A. Rich. Tent. Fl. Abyss. i. 304 (1847); Harv. & Sond. Fl. Cap. i. 133 (1859-60); Harv. Gen. S. Afr. Pl. ed. 2, 320 (1868); Benth. & Hook. f. Gen. Pl. iii. 14 (1880); Engl. & Prantl, Nat. Pflanzenfam. iii. Abt. 1 B, 89 (1889); Dalla Torre & Harms, Gen. Siphonog. 158 (1900); Dyer, Fl. Trop. Afr. vi. sect. 1. 10 (1909); Dyer, Fl. Cap. v. sect. 1. 399 (1910); Marloth, Fl. S. Afr. i. 213 (1913); Thonner Fl. Pl. Afr. 193 (1915); Phill. Gen. S. Afr. Pl. 255 (1926).

The original specimens of *P. campestris* Soland.—those of the wild parent plant and the cultivated specimens from which Solander described—are preserved in the British Museum (Natural History) Herbarium, while there exists also a fine plate made from the type plant by Sir James Edward Smith (Spicil. Bot. t. 1: 1791). So far as the writer is aware, it is not known whether the type specimen of *Meerburgia glomerata* Moench is still in existence.

XXXI.—ADDITIONS TO INDEX KEWENSIS: XI.*

Griffith, Itinerary Notes (Posthumous Papers, vol. ii., edited by John M'Clelland), 1848.

Attention having been drawn to the omission from the Index Kewensis of certain names contained in the above work, it was decided to examine thoroughly the entire volume with the view to abstracting any others that had been overlooked. This has resulted in the addition of 65 names that either have been entirely omitted from the Index or were included from a work bearing a later date.

The "Itinerary Notes" contain an Introduction including Letters of Griffith to Wight covering the period 1838-44, as well as an explanatory note by the Author.

The body of the work is divided into four books which are continuously paged, books I-III. dealing respectively with the Khasyah Flora, the Bootan Flora and the Afghan Flora. It is from these three books that the following names have been abstracted. According to the Author's note on p. lxiv. of the Introduction, the Khasyah Catalogue (Book I) corresponds with the set of Khasyah plants reserved for his own use and made in the months of October and November 1837. He also gives a record of the numbers of those plants which were collected in the near neighbourhood of the Khasyah Hills and included in the Flora.

Book II. (Bootan Florá, pp. 99-204).

The numbers in this book correspond with the original numbers attached to the specimens collected during Captain Pemberton's Mission to Bootan in 1837-38.

Book III. (Afghan Flora, pp. 205-367).

This deals with the collections made between Shikapore and Peshowur, with numbers up to 1273. Additional numbers 1-201, the second year's collection, also a supplementary list numbers 1-15, are included.

These notes as edited by M'Clelland have been compared with the original manuscript, and where it has been considered necessary certain corrections have been made. These mostly concern typographical errors.

The following is the list of names which will be included in Supplement VIII. of the Index Kewensis. Each name is followed by the number of the page on which it occurs in the Itinerary Notes and by the running number of the specimen. Binominals followed by descriptions are cited first. Those that have nothing more than collector's notes or are bare names are so indicated by the words "nomen subnudum" or "nomen." M. L. G.

Adhatoda cymosa 7, no. 96.
Villarsia eglandulosa 15, no. 225.
Crotalaria hovcoides 26, no. 396.

*Continued from *Kew Bull.* 1930, p. 45.

Begonia orchidiflora 38, no. 627.
Anisadenia pubescens 54, no. 833.
Parnassia nana 58, no. 903.
Dendrobium Bolbophylli 65, no. 1019.
Thibaudia affinis 84, no. 1218.
Ficus papyrifera 101, no. 32.
Ficus terminalioides 101, no. 33.
Solanum farinaceum 111, no. 148.
Leptospartion pp. iii, 114, no. 193.
Leptospartion grandiflorus, pp. iii, 114, no. 193.
Thibaudia myrtifolia 125, no. 434.
Panax rhododendrifolium 127, no. 487.
Cupressus pendula 131, no. 529 ; et l.c. 143, no. 679a.
Acanthus carduaceus 144, no. 688.
Rhododendron macranthum 144, no. 690.
Thibaudia orbicularis 160, no. 820.
Swertia plantaginifolia 171, no. 880.
Pythonium ecaudatum 185, no. 941a.
Convallaria cirrhosa 191, no. 1019.
Polygonum rheiflorum 224, no. 170.
Bignonia punicoides 227, no. 202.
Euonymus spinosus 279, no. 721a ; et l.c. 430.
Heliotropium flavum 322, no. 1271.
Typha angustissima 342, no. 77.
Diospyros Umlovok 355, no. 137.
Justicia lobatum 10, no. 131, sphalm. : J. Ecbolium.
Paspalum flagellatum 15, no. 216.
Hedyotis subscandens 18, no. 270.
Tradescantia aspera 19, no. 292.
Vandellia rotundifolia 27, no. 414, nomen subnudum.
Saxifraga ligularis 38, no. 628 ; et l.c. 156, no. 777, nomen subnudum.
Betula corylifolia 54, no. 834, nomen subnudum.
Ophiopogon leptophylla 62, no. 955, nomen subnudum.
Eriocaulon fluitans 65, no. 1005, nomen subnudum.
Dendrobium eriiflorum 66, no. 1020, nomen subnudum.
Dendrobium fuscescens 73, no. 1123, nomen.
Quercus vestita 90, no. 1325, nomen subnudum.
Callicarpa salviifolia 94, no. 1390 ; et l.c. 406, nomen subnudum.
Cephalanthus spinosus 94, no. 1407, nomen subnudum.
Cymbopogon hispidus 96, no. 1429a, nomen subnudum.
Knoxia exaltata 96, no. 1431, nomen subnudum.
Peristrophe nodosa 111, no. 152, nomen subnudum.
Bambusa andropogonifolia 124, no. 417, nomen subnudum.
Smilax gaultheriifolia 126, no. 463, nomen subnudum.
Maesa salicifolia 128, no. 491, nomen subnudum.
Mespilus microphyllus 130, no. 518, nomen subnudum.
Cirsium decurrens 132, no. 539, nomen subnudum.
Cerastium canum 134, no. 557, nomen subnudum.
Scirpus kysooroides 155, no. 765, nomen subnudum.
Morus ribesioides 157, no. 795, nomen subnudum.
Viburnum canum 186, no. 959, nomen subnudum.
Rhodora deflexa 187, no. 969, nomen subnudum.
Pyrus arioides 194, no. 1060, nomen subnudum.
Croton malvifolia 200, no. 1166, nomen subnudum.
Populus amygdalacifolius 286, no. 812, nomen subnudum.
Aconitum salisburifolium, 306 no. 1045, nomen subnudum.
Onosma versicolor 315, no. 1175, nomen subnudum.
Lythrum hypericoides 318, no. 1215, nomen subnudum.
Rubia oppositifolia 356, no. 144, nomen subnudum.

The following names appear for the first time in Griffith, Journals of Travels, one year earlier than in the above work. The references to both works are quoted.

Abies spinulosa *Griff.* Journ. Trav. 259, 265 (1847); Griff. Itin. Notes (Posth. Papers, ii.) 145, no. 694 (1848).

Santonica *Griff.* Journ. Trav. 349 (1847), in obs. et adnot., nomen (Compositae).

Santonica achillaeoides, *Griff.* l.c.; Griff. Itin. Notes (Posth. Papers, ii.) 259, no. 499 (1848).

XXXII.—FUNGI EXOTICI: XXVII.

E. M. Wakefield.

Merulius miniatus *Wakef.*

Resupinatus, effusus, arcte adnatus, tenuis, mollis, circiter 10 cm. longus, 1–2 cm. latus, margine indeterminato aurantiaco. Hymenium miniatum, poroso-reticulatum, sicco facile e subiculo separandum. Contextus 140–160 μ crassus, ex hyphis hyalinis, 2–4 μ diametro, tenuiter tunicatis, non nodoso-septatis, laxe intertextis, compositus. Basidia clavata, 4-sterigmatica, 15–18×5 μ. Sporae hyalinae, allantoideae, 5–6×1–1·5 μ. Gloeocystidia cylindrica vel fusiformia, 40–60×5–7 μ, tenuiter tunicata, succo rubido repleta, e plicis ad 20 μ emergentia.

New Zealand. York Bay, Wellington, on dead twigs on the forest floor, *E. J. Butler*, No. 1218, July 1923.

In general appearance this species recalls *Poria taxicola* (Pers.) Bres. and *Merulius Ravenelii*, but the colour is brighter than in either. From *Poria taxicola* it differs in the narrower basal hyphae and from *M. Ravenelii* in the presence of thin-walled gloeocystidia, with coloured contents, on the folds of the hymenium.

Aleurodiscus peziculoides *Wakef.*

Fructificationes circiter 1 mm. diametro, gregariae, erumpentes, haud confluentes, convexae, genus *Peziculam* in mentem referentes, margine libero, haud incurvo, infra brunneo. Hymenium convexum, pruinatum, ex alutaceo roseo-cinnamomeum. Basidia juvenilia clavata, intus granulata, 75–80 (–200)×12–16 μ. Paraphyses (acanthophyses) elongatae, supra vix incrassatae, apice aculeatae, 4–6 μ diametro. Sporae non visae. Hyphae hyalinae, dense intertextae, vix distinguendae, crasse tunicatae, non nodosae, 4–4·5 μ diametro, accretionibus mineralibus magnis subglobosis intermixtis.

New Zealand. York Bay, Wellington, on dead twigs on the forest floor, *E. J. Butler and G. H. Cunningham*, No. 1210, July 1923.

In habit the species recalls *A. Farlowii* Burt and *A. Grantii* Lloyd. From the former it differs in the more slender paraphyses, aculeate only at the apex, and from the latter in the microscopic characters, in so far as they were indicated by the author. The flesh is remarkably firm for the genus and the elements difficult to distinguish. Scattered throughout the subhymenial tissue are large globose clusters of mineral matter, reaching up to 30 μ in diameter.

Uromyces rhodesicus *Wakef.*

Sori teleutosporiferi amphigeni, plerumque epiphylli, maculis decoloratis insidentes, sparsi vel irregulariter aggregati, ad 0·5 mm. diametro, hinc inde confluentes, epidermide fissa cincti, pulverulenti, atrobrunnei. Teleutosporae globosae vel depresso-globosae, apice rotundatae, non vel lenissime incrassatae, obscure castaneo-brunneae, 23–27 × 26–29 μ (plerumque 25 × 27 μ), episporio minute reticulato, 3 μ crasso, ad apicem usque 4 μ crasso. Pedicellus hyalinus, subpersistens, 30–50 μ longus, deorsum rugulosus. Uredosporae immixtae subglobosae vel late ellipticae, 25–26 × 28–32 μ, episporio 3 μ crasso, poris germinationis 3–4 plerumque equatorialibus instructo.

Uromyces rhodesicus Wakef.
a, Teleutospores (× 500). b, Uredospore (× 500).

Tropical Africa. Chakari, Southern Rhodesia, on leaves of *Bauhinia* sp., *J. C. F. Hopkins*, No. 1321, May 26, 1930.

The species differs from *U. congensis* Syd. in the reticulate teleutospores. All other known reticulate-spored species of *Uromyces* on *Bauhinia* are from South America, and all differ somewhat from the present form. The most marked character of *U. rhodesicus* is the almost constant depressed-globose shape of the teleutospore ; it is never elliptical. The spore wall is very dark and opaque, so that the reticulate markings can be seen well only after treatment with a clearing reagent.

Aecidium Hederae *Wakef.*

Pycnidia amphigena, praecipue hypophylla, laxe gregaria, primo mellea demum obscurantiora, 80–120 μ diametro. Aecidia hypophylla vel petiolicola, conferta, per folii totam superficiem aequaliter distributa, matricem deformantia, cupulata, 0·5–1·5 mm. diametro, margine albido pulchre revoluto 5–7 inciso. Pseudoperidii cellulae angulatae, firme conjunctae, 15–20 μ diametro, vel 25 × 20 μ, pariete 2–2·5 μ crasso, verrucoso-striato. Aecidiosporae globosae vel subglobosae, leviter angulatae, subhyalinae, laeves, 18–19 × 15 μ, tenuiter tunicatae, poris germinationis 4–5 instructae.

India. Murree, Punjab, 7000 ft., on leaves of *Hedera Helix*, *W. T. Saxton*, No. 2335, May 12, 1921 (type) ; Malkandi, Kagan, W. Himalaya, 4500 ft., on leaves of *Hedera Helix*, *J. F. Duthie*, May 25, 1897.

Ivy leaves attacked by this fungus have very swollen petioles and much reduced and distorted laminae. The aecidia, which are large and conspicuous, cover the whole surface of the petiole and the under side of the leaf. The fungus is said to be fairly common in the forest at Murree.

Aecidium Lophopetali *Wakef.*

Aecidia ramicola, in apicibus tumores globosos vel irregulares 4–9 mm. diametro efformantia, in substantia tumorum dense disposita profundeque immersa, 0·5–1 mm. diametro. Pseudoperidii cellulae irregulares, crasse verrucosae, 40–60 × 15–18 (–20) μ. Sporae a pseudoperidii cellulis vix distinctae, elongato-rhomboideae vel irregulariter fusoideae, subhyalinae, 35–50 (–65) × 15–20 μ, dense et crasse verruculosae, verrucis facile deciduis, episporio 2–3 μ crasso.

India. Dehra Dun, on branches of *Lophopetalum Wightianum*, *A. Hafiz Khan*, 1922.

This is a very remarkable fungus. The aecidia form the entire contents of small globose or irregular galls which occur singly at the apices of the branchlets of a "witch-broom"-like structure. The galls resemble those formed by *Aecidium ponderosum* Syd., but are smaller, and the peridial cells are larger. Unfortunately the aecidia in the present specimens are all closed, so that there is no indication as to how the spores from the interior of the gall are set free. The whole structure appears to be somewhat abnormal, the aecidiospores being hardly distinct from the outer cells, which adhere and form a sort of pseudoperidium round each sorus. The spores are unusually large and coarsely warted, and the warts are apparently very brittle, since they fall off to some extent in the process of mounting for microscopic examination.

Sphacelotheca Sclerachnes *Wakef.*

Sori in inflorescentiis evoluti, easque omnino destruentes, primitus a vagina inclusi circiter 1–2 cm. longi, membrana cellulis subhyalinis 10–12 μ diametro tecti, columella centrali praediti. Massa sporarum atrobrunnea, mox pulverulenta. Sporae maxime variabiles, globosae, subglobosae, pyriformes vel citriformes, brunneo-violaceae, laeves, 10 μ diametro, vel 12–15 × 9–10 μ.

Siam. Bangkok, in the inflorescence of *Sclerachne punctata*, *A. Kerr*, No. 3, Nov. 10, 1921.

No other smut appears to have been recorded on this host. The irregularly shaped spores are unusual.

Septoria Cotyledonis *Wakef.*

Maculae rotundatae, fuscidulae, 3–10 mm. diametro, margine elevato circumdatae. Pycnidia minutissima, vix sub lente distinguenda, tenue subhyalino-tunicata. Conidia filiformia, curvula, utrinque rotundata, 50–65 × 2·5 μ.

South Africa. Elsenburg, Natal, on leaves of *Cotyledon orbiculata*, *P. A. van der Bijl*, No. 890, Sept. 22, 1922.

Septogloeum punctatum *Wakef.*

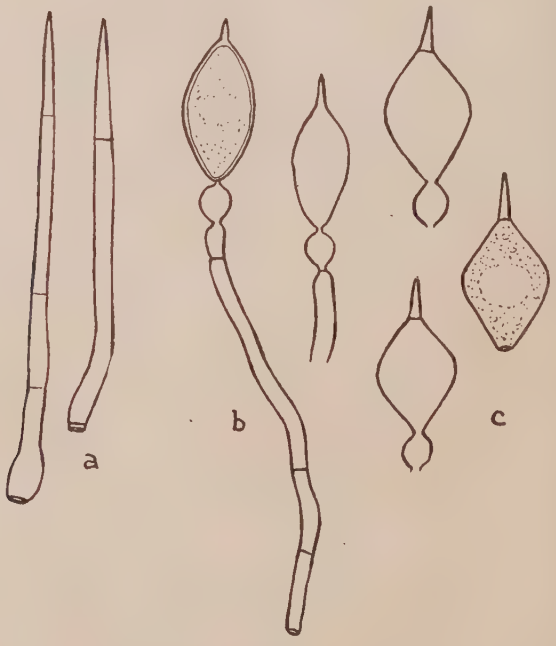
Maculae aridae, elongatae, angulatae, nervis limitatae, fusco-marginatae, circiter 8 mm. latae. Acervuli hypophylli, atro-olivacei, punctati, compacti, pulvinati, primo epidermide tecti, demum erumpentes. Conidiophora filiformia, densissime aggregata, olivacea. Conidia cylindracea, utrinque rotundata, dilute olivacea, 25–32 × 5 (–6) μ, demum 3-septatae.

South Africa. Durban, Natal, on leaves of *Eugenia cordata*, *P. A. van der Bijl*, No. 323, 1922.

Differs from *S. hirudinisporum* Speg. in several characters, and especially in the shape of the conidia.

Beltrania (?) **malaiensis** *Wakef.*

Hyphae fertiles erectae, flexuosae, simplices, dense aggregatae, 1–4-septatae, dilute fuligineae, 110–160 × 5–6 μ, sursum paullum incrassatae. Setulae rigidae, 1–3-septatae, atrobrunneae, apicibus acutis pallidioribus, laeves, 120–140 × 4 μ, basi geniculatae, saepe usque 9 μ incrassatae. Conidia rhomboidea, e sterigmatibus ellipticis, hyalinis, 9–10 μ diametro oriunda, brevissime stipitata, medio non constricta, primo continua (an demum 1-septata?), 32–35 × 22–25 μ, apice rostro tenuissimo acuto hyalino 10–14 × 2 μ praedita.



Beltrania (?) *malaiensis* Wakef.
a, Setae (× 500). b, Conidiophores with conidia (× 500).
c, Detached conidia (× 500).

Federated Malay States. Kuala Lumpur, isolated from seedlings of *Dichopsis Gutta* and grown on sterilised blocks of *Hevea* wood, *A. Thompson*, February 1924.

The fungus was isolated from the roots and collar of Gutta Percha seedlings. In culture on blocks of *Hevea* wood it forms a dense, dark brown, almost black crust, easily separable in small pieces. The rhomboidal shape of the conidia, their mode of origin from a swollen sterigma, and the presence of scattered setae, agree in general with the characters of the genus *Beltrania* and of the original species, *B. rhombica* Penzig. The conidia however, have not been found septate in any of the present material. This species is marked by its very large conidia, as compared with the two other described species of the genus *Beltrania*.

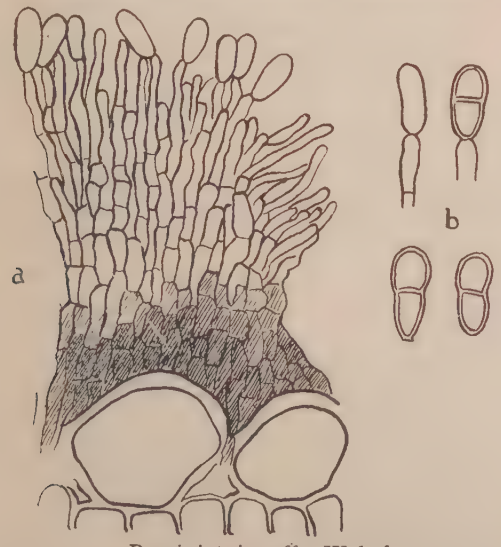
Cercospora Didymochitonis *Wakef.*

Maculae epiphyllae, parvulae, indistinctae, sparsae vel aggregatae quandoque confluentes, luteae, 1·5–2 mm. diametro. Acervuli hypophylli, minuti, densissime congesti, plagulas effusas, olivaceas, velutinas, vix 1 mm. diametro efformantes. Conidiophora fuliginea, flexuosa, 20–70 × 4 μ, demum 1–3-septata. Conidia dilute olivacea, fusoideo-clavata, 3–5-septata, 30–55 × 3–3·5 μ.

Fiji. On leaves of *Didymochiton Richii*, *W. Greenwood*, No. 18, July 1922.

Pucciniopsis caffra *Wakef.*

Sporodochia plerumque epiphylla, convexo-pulvinata, erumpenti-superficialia, ex olivaceo atra, 200–400 μ diametro. Stroma atro-brunneum, compactum, sub cuticulo oriundum. Conidiophora



Pucciniopsis caffra Wakef.
a, Portion of acervulus (× 500). b, Conidia and conidiophores (× 500).

dense stipata, flavo-brunnea, cylindrica vel clavata, non septata, 10–15 × 4–5 μ. Conidia brunnea, laevia, obclavata, 1-septata, vix constricta, cellula superiore interdum latiore, 18–20 (–24) × 8–10 μ.

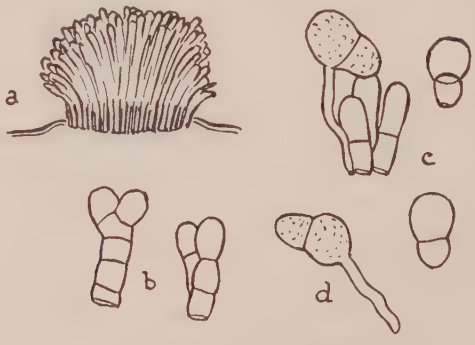
South Africa. Van Stadens Pass, Cape Province, on leaves of *Erica caffra*, *E. M. Doidge*, No. 10865, Nov. 13, 1917.

Pucciniopsis quercina *Wakef.*

Maculae irregulares, 4–12 mm. diametro, saepe confluentes. Sporodochia epiphylla, rarissime hypophylla, dense aggregata, atra, orbicularia, 200–300 μ diametro. Conidiophora erecta, dense aggregata, ad 4–5-septata, simplicia vel sursum bifurcata, fuscidula, 7–8 (–9) μ diametro. Conidia fusca, pyriformia, leviter verruculosa, inaequaliter 1-septata, 18–22·5 × 12–14 μ.

India. Kamalban Forests, Kagan Valley, Hazara, 6500–7000 ft., on leaves of *Quercus dilatata*, *A. Hafiz Khan*, Sept. 11, 1924.

The leaves are sometimes almost entirely covered by the black stromata. The conidia have not been seen attached to the conidiophores, being practically all shed and germinating. The germ-tube emerges from the larger (presumably upper) cell, and frequently penetrates downwards between the conidiophores.



Pucciniopsis quercina Wakef.
a, Acervulus. b, Conidiophores (× 500). c, Conidia, showing one germinating on the surface of acervulus (× 500). d, Germinating conidium detached (× 500).

XXXIII.—CONTRIBUTIONS TO THE FLORA OF SIAM.* Additamentum XXX.

Gilibertia siamensis *Craib* [Araliaceae-Panaceae]; a *G. Chevalieri* R. Vig. nervis multo minus prominentibus recedit.

Frutex circa 2 m. altus (ex *Kerr*), partibus omnibus glaber; ramuli saepissime pallescentes. *Folia* alterna, interdum subopposita, lanceolato-ovata, apice acuminata vel subacuminata, acuta, basi cuneata vel rotundata, haud rarius parum inaequilateralia, 5·5–13 cm. longa, 2–5 cm. lata, rigide chartacea, sicco pallide

*Continued from *K.B.*, 1930, p. 427.

viridia vel fuscescentia, costa supra prominula subtus prominente, e basi trinervia, nervis duobus lateralibus obliquis, nervis secondariis (e costa ortis) utrinque 5–6 rectis intra marginem anastomosantibus pagina utraque subconspicuis, margine integra, parum recurva, petiolo 6–16 mm. longo supra canaliculato suffulta. *Umbellae* terminales, simplices (an semper ?), pedunculo communi apice parvibracteato circa 1 cm. longo suffultae ; pedicelli sub anthesin 5 mm. longi. *Receptaculum* 2 mm. longum, sulcatum. *Calyx* circa 1 mm. longus, vix lobatus. *Petala* 5, inter se libera, 3 mm. longa, 2·25 mm. lata. *Stamina* 5, filamentis 2 mm. longis, antheris versatilibus 1·25 mm. longis. *Discus* carnosus, corrugatus. *Styli* 5, liberi, vix 1 mm. longi. *Fructus* ellipsoideus, pallide brunneus, circa 1 cm. longus, stylis persistentibus coronatus.

Krat, Kao Kuap, 1000 m., light evergreen forest, *Kerr* 17812.

Viburnum Kerrii *Geddes* [Caprifoliaceae] ; a *V. odoratissimo* Ker foliis haud tam longis basi latis, inflorescentia minore, a *V. Simonsii* Hook. f. et Th. foliis latioribus, floribus maioribus, a *V. sessilifloro* Geddes nervis lateralibus magis approximatis obliquis differt.

Arbor circa 4 m. alta, etiam in silvis densis sempervirentibus ut arbor magna crescens (ex *Kerr*) ; rami primo rubro-brunnei, compressi, glabri, mox grisei, teretes. *Folia* ovata vel ovato-elliptica, apice acuminata, basi rotundata vel truncata, 6·8–12 cm. longa, 4·6–6·4 cm. lata, supra brunnea, glabra, subtus pallidiora, inter costam nervosque subtus pilosa, ceteris partibus glabra, coriacea, nervis lateralibus utrinque circa 7 pagina superiore impressis inferiore prominentibus, margine ab apice ad medium breve serrata, deinde integra, petiolo 1·3–2 cm. longo crasso supra canaliculato glabro suffulta. *Cymae* terminales, ramulis striatis puberulis ; bracteae bracteolaeque lineari-lanceolatae, acutae, puberulae ; flores aut sessiles aut brevipedicellati. *Calyx* 0·75 mm. longus, lobis 5 brevibus et obtusis. *Corolla* alba (ex *Kerr*) ; tubus 1·5 mm. longus; lobi 5, patentes, rotati, orbiculares, circa 2·5 mm. diametro. *Stamina* 5, ad tubum corollae infra os affixa, filamentis subulatis basi latis 2·5 mm. longis glabris, antheris exsertis ellipticis apice obtusis basi bifidis 1·5 mm. longis 0·9 mm. latis glabris ; a situ staminum ad basem tubi corollae distat 1 mm., antheris summis usque ad summum corollae tubum 2 mm. distat. *Ovarium* uniloculare, ovulo singulo pendulo ; stylus 1·5 mm. longus, subulatus, basi latus ; stigma inconspicue trilobatum.

Doi Angka, 2400 m., edge of open swamp, *Kerr* 5318.

Viburnum sessiliflorum *Geddes* [Caprifoliaceae] ; a *V. arboricolo* Hayata bracteis conspicue maioribus, a *V. odoratissimo* Ker inflorescentia petiolisque stellato-pubescentibus, floribus maioribus differt.

Arbor circa 8 m. alta (ex *Kerr*). *Folia* elliptica, oblonga, vel oblongo-oblanceolata, apice breviter obtuse acuminata vel rotundata, basi cuneata, 8–16·5 cm. longa, 4·2–8·2 cm. lata, subcoriacea, supra

brunnea vel brunneo-viridia, subtus pallidiora, minute nigro-maculata, pagina utraque ad costam pilis paucis stellatis deciduis instructa, subtus ad nervorum axillas saepissime pilosa, nervis lateralibus utrinque 4–6 pagina superiore impressis inferiore prominentibus, costa crassa, nervis transversis inter se parallelis subtus subconspicuis, margine revoluta, apicem versus pauci-denticulata, petiolo 1·8–2·3 cm. longo crasso stellato-pubescente supra canaliculato suffulta. *Cymae* terminales, ad 13 cm. longae, ramulis sicco ferreis stellato-pubescentibus; bracteae lineari-lanceolatae, et stellato-pubescentes et ferreo-hirsutae; flores albi (ex *Kerr*), sessiles. *Receptaculum* glabrum. *Calyx* brevis, glaber, lobis 5 obtusis. *Corollae* tubus 0·5 mm. longus, glaber; lobi 5, oblongi, obtusi, rotati, 3 mm. longi, 2·5 mm. lati. *Stamina* 5, ad tubi corollae os inter lobos affixa, filamentis brevissimis, antheris ambitu elliptico-oblongis 1·8 mm. longis. *Ovarium* uniloculare, ovulo singulo pendulo, stylo breve et lato, stigmate inconspicue trilobato.

Lôi, Kao Krading, 900 m., evergreen forest, *Kerr* 8651.

Nauclea brunnea *Craib* [Rubiaceae-Naucleae]; a *N. subdita* (Korth.) foliis maioribus, a *N. Junghuhnii* (Miq.) foliis tenuioribus, ab ambabus cortice rubro-brunneo, haud cinereo, recedit.

Arbor circa 20 m. alta (ex *Kerr*); ramuli glabri, obtuse angulati, cortice rubro-brunneo obtecti, lenticellis parvis conspicuis. *Folia* saepissime oblongo-ovata vel suboblonga, apice obtuse acuminata vel subrotundata, basi cuneata rotundatave, 11–18 cm. longa, 5–8 cm. lata, chartacea, supra glabra, subtus ad nervorum axillas paucipilosa, aliter glabra, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–8 sat obliquis subrectis intra marginem anastomosantibus supra conspicuis subtus prominentibus, nervis transversis subtus conspicuis, reticulatione vix conspicua, petioo 7–17 mm. longo supra canaliculato glabro suffulta; stipulae delapsae. *Pedunculi* axillares et solitarii vel terminales, solitarii vel saepius ternati, 1·5–2·5 cm. longi, breviter pubescentes, medio vel infra medium bracteis deciduis instructi; capitula paulo post anthesin 1 cm. diametro, pubescentia.

Nakawn Sritamarat, Kao Luang, 500 m., evergreen forest, *Kerr* 15572.

Adina dissimilis *Craib* [Rubiaceae-Naucleae]; ab *A. rubescente* Hemsl. ramulis tenuioribus, foliis pro longitudine angustioribus subtus haud pubescentibus recedens.

Arbor circa 8 m. alta (ex *Kerr*); ramuli graciles, primo breviter pubescentes, mox puberuli, cortice cinereo-brunneo vel cinereo obtecti, lenticellis obscuris. *Folia* parum inaequilateralia, elliptico-oblonga, oblongo-oblanceolata, vel oblanceolata, apice obtuse acuminata vel caudato-acuminata, basi inaequilateralia, cuneata, 7–11 cm. longa, 2–3·5 cm. lata, rigide chartacea, sicco viridia, subtus pallidiora, supra glabra, subtus costa et plus minusve nervis lateralibus puberula praetereaque ad nervorum axillas pilosa, nervis

lateralibus utrinque saepissime 9 supra conspicuis subtus subprominentibus intra marginem anastomosantibus, petiolo usque ad 2 cm. longo supra apicem versus canaliculato aliter subcanaliculato puberulo suffulta ; stipulae pallide virides, cito deciduae, 7 mm. longae, fere ad basem bifidae, segmentis linearibus acutis circa 1 mm. latis. *Capitula* saepissime 5–7, rarius 3, in racemos terminales ad 7 cm. longos disposita, rarissime solitaria, axillaria, pedunculis inferioribus ad 2·5 cm. longis ad medium vel paulo supra medium bracteatis superioribus vix 1 cm. longis, omnibus cum rhachi breviter pubescentibus ; capitula sub anthesin stylo exserto excluso 1 cm. diametro ; bracteae inter flores graciles, 1·75–2 mm. longae ; alabastra sulcata, parce puberula. *Receptaculum* adpresse hirsutum, vix 1 mm. longum. *Calycis* tubus brevis, segmenta 5, inter se parum inaequalia, linearia, obtusa, ad 1·5 mm. longa, apicem versus pauperius ciliolata. *Corollae* tubus circa 3 mm. longus, 5-sulcatus, superne parum ampliatus, lobi 5, suboblongi, apice cucullati, 1·75 mm. longi, 0·75 mm. lati. *Stamina* 0·75 mm. infra tubi apicem inserta, filamentis brevibus, antheris circa 1 mm. longis. *Stylus* longe exsertus, 8·5 mm. longus, glaber, stigmate clavato.

Krabi, Lanta, 200 m., common in evergreen forest, *Kerr* 18977.

Adina polycephaloides *Craib* [Rubiaceae-Naucleae] ; ab affini *A. polycephala* Benth. partibus omnibus praesertim foliis et corolla maioribus, bracteolis tenuioribus, calyce intra piloso recedit.

Arbor parva vel mediocris (ex *Winit*) ; ramuli glabri, brunnei vel fusco-brunnei, lenticellis pallidis angustis longitudinaliter extensis vel rotundatis. *Folia* opposita, oblongo-elliptica vel oblongo-ovata, apice obtuse acuminata, basi cuneata sed saepe inaequilateralia, latere altero cuneata, altero cuneata vel rotundata, 13–21 cm. longa, 6–10 cm. lata, matura coriaceo-chartacea, sicco supra fusco-viridia, subtus saepissime plus minusve brunnescentia, subtus ad nervorum axillas saepissime breviter pilosa, aliter glabra, costa supra impressa subtus prominente, nervis lateralibus utrinque 8–10 supra conspicuis subtus prominentibus, nervis transversis pagina utraque conspicuis vel inferiore subprominulis, petiolo 1–1·5 cm. longo glabro supra canaliculato suffulta ; stipulae circa 5 mm. longae, breviter vel altius bilobatae, cito deciduae. *Capitula* in racemos simplices vel iterum ramosos axillares et terminales sessiles 4·5–7·5 cm. longos disposita, sub anthesin usque ad 2 cm. diametro pedunculo fere 1 cm. longo inconspicue parce puberulo suffulta ; flores lutei, odorati (ex *Winit*), sessiles ; bracteolae lineari-spatulatae, pilosae, calyci subaequilongae. *Receptacula* inter se libera, 1 mm. longa, pilosa. *Calycis* tubus brevis, utrinque pilosus, segmenta oblonga, apice obtusa rotundatave, 1 mm. longa, circa 0·5 mm. lata, inferne utrinque sparse pilosa, aliter glabra. *Corollae* glabrae tubus 3·5 mm. longus, lobi 5, oblongi vel deltoideo-oblongi, obtusi, circa 1·5 mm. longi et 1 mm. lati. *Stamina* apicem versus corollae tubi inserta, filamentis circa 0·25 mm. longis, antheris exsertis linearibus 1·25 mm. longis.

Stylus 9·5 mm. longus, stigmate generis; ovarium biloculare, placentis pendulis, ovulis numerosis.

Chiengmai, Ta Yak, 400 m., evergreen forest, *Winit* 1860.

Uncaria glaucescens *Craib* [Rubiaceae-Naucleae]; species *U. velutinae* Hav. habitu similis a qua calycis lobis subacutis haud clavatis distinguenda.

Frutex cirrhis deflexo-uncinatis scandens; ramuli pallide brunnei, primo breviter hirsuti, plus minusve conspicue 4-angulati, mox conspicue quadrangulares, ad 8 mm. diametro, puberuli, internodiis elongatis. *Folia* saepissime oblongo-elliptica vel subelliptica, apice brevius obtuse acuminata, basi rotundata, ima basi truncata vel cordatula, 11–15 cm. longa, 4·5–8·5 cm. lata, chartacea, subtus matura plus minusve glaucescentia, supra ad costam nervosque laterales breviter adpresse ferrugineo-hirsuta, aliter sparse hirsuta, subtus ad costam nervosque laterales sparse hirsuta, pilis paucis mox deciduis, ad nervulos breviter adpresse hirsuta, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–9 supra conspicuis subtus prominentibus, nervis transversis inter se parallelis subtus prominulis, petiolo ad 8 mm. longo supra canaliculato indumento ei ramulorum simili tecto suffulta; stipulae deciduae. *Pedunculi* axillares, infructescentes 4·5–5 cm. longi, indumento ei ramulorum simili tecti, circa 1 cm. infra apicem bractearum cicatricibus notati; pedicelli 1·5–2 cm. longi, breviter adpresse ferrugineo-hirsuti. *Calycis* capsulam coronantis tubus 4 mm. longus, lobi lanceolati angusteve deltoidei, subacuti, 1·5 mm. longi, cum tubo pilis brevibus ferrugineis adpressis obtecti. *Capsula* 1 cm. longa, costata, indumento ei pedicelli simili obtecta; semina, alis inclusis, 5 mm. longa.

Ranawng, Kao Pawta Luang Keo, 200 m., evergreen forest, *Kerr* 16997.

Wendlandia nobilis *Geddes* [Rubiaceae-Rondeletieae]; a *W. glomerulata* Kurz foliis brevioribus pro longitudine conspicue latioribus haud longe acuminatis inter alia facile distinguenda.

Arbor circa 8 m. alta (ex *Kerr*); ramuli primo adpresse hirsuti, cito glabri, angulati, cortice rubro obtecti, lenticellis haud conspicuis. *Folia* opposita, oblongo-lanceolata vel lanceolata, interdum oblonga, apice subacute acuminata, basi cuneata, saepe inaequilateralia, latere altero cuneata, altero acuminata, 4–9 cm. longa, 1·5–3·5 cm. lata, sat rigida, supra glabra, subtus ad costam nervosque laterales pilis paucis adpressis instructa, costa supra parum prominula subtus prominente, nervis lateralibus utrinque 7–8 supra plus minusve conspicuis subtus prominulis intra marginem anastomosantibus, reticulatione gracili subconspicua, margine parum recurva, petiolo 6–10 mm. longo primo breviter adpresse hirsuto supra canaliculato suffulta; stipulae deciduae, circa 4 mm. longae, medio constrictae, apice complanatae, breviter adpresse hirsutae. *Paniculae* terminales, sessiles, saepissime circa 12 cm. longae et latae, rhachi et pedunculis

hirsutis, pilis subadpressis ; bracteae ad ramulorum bases foliaceae, anguste lanceolatae, circa 1 cm. longae, bracteis aliis minoribus, ultimis circa 2 mm. longis. *Receptaculum* adpresse hirsutum. *Calyx* circa 0·75 mm. longus, fere ad basem 5-fidus, segmentis ovato-oblongis obtusis dorso breviter adpresse hirsutis. *Corollae* tubus circa 3 mm. longus, intra apice barbatus, lobi 5, circa 1·25 mm. longi et 0·5 mm. lati, obtusi. *Stamina* ad corollae tubi apicem posita, antheris parvis apiculatis exsertis. *Stylus* filiformis, glaber.

Nan, Doi Pu Ka, 1700 m., savannah on ridge, *Kerr* 4931.

Greenea oblonga *Craib* [Rubiaceae-Rondeletieae] ; a *G. Wightiana* Wight et Arn. eiusque affinioribus corollae lobis anguste oblongis recedit.

Arbor circa 5 m. alta (ex *Kerr*) ; ramuli pilis sat rigidis adpressis primo pallidis mox ferrugineis tecti. *Folia* oblongo-oblanceolata, oblanceolata, vel rarius oblanceolato-obovata, apice acute acuminata, basi in petiolum longius angustata, 16–29 cm. longa, 4–7 cm. lata, rigide chartacea, sicca supra fuscescentia, subtus brunnescentia, supra ad costam adpresse setosa, ad nervos laterales et marginem versus sparsius adpresse setulosa, subtus ad costam nervos nervulosque adpresse setulosa, costa supra conspicua subtus prominente, nervis lateralibus utrinque circa 18 supra conspicuis vel subprominulis subtus prominulis, nervis transversis subtus subprominulis, petiolo 10–15 mm. longo supra canaliculato apicem versus lamina decurrente alato suffulta ; stipulae oblongae, 1–1·5 cm. longae, indumento dorso ei ramulorum et petiolorum simili instructae. *Cymae* paniculam terminalem ad 10 cm. longam et 14 cm. diametro formantes ; flores albi (ex *Kerr*), sessiles ; bracteae saepissime receptaculo subaequilongae, saepe tridentatae. *Receptaculum* 1·5 mm. longum, hirsutum. *Calycis* tubus brevis, lobi 5, lanceolati, subacuti, saepe inter se inaequales, 1·5–1·75 mm. longi, inferne saepe dentati, dorso hirsuti, intra glabri, ciliati, post anthesin arcte reflexi. *Corolla* extra pubescens ; tubus ad 8 mm. longus, intra glaber ; lobi 5, oblongi, apice emarginati, ad 2 mm. longi et 1 mm. lati, intra inferne pilosi. *Filamenta* brevia ; antherae sicco fuscae, ad corallae tubi apicem attingentes, 2 mm. longae. *Stylus* exsertus, stigmatibus duobus mox recurvis inclusis ad 1·3 cm. longus, glaber.

Takuapa, Kapong, 100 m., evergreen scrub, *Kerr* 17136.

Greenea siamensis *Craib* [Rubiaceae-Rondeletieae] ; a *G. Wightiana* Wight et Arn. receptaculo pilis longioribus paucioribus rigidis instructo, corolla breviore latiore indumento densiore instructa distinguenda.

Frutex circa 4 m. altus (ex *Kerr*) ; ramuli primo adpresse hirsuti, mox glabrescentes, cinnamomeo-corticati. *Folia* opposita, oblonga, oblongo-elliptica, vel oblongo-oblanceolata, apice acute acuminata, basi longius attenuato-cuneata, 20–30 cm. longa, 5–9·5 cm. lata, rigide chartacea, sicco supra olivacea vel fusco-brunnea, subtus viridi-brunnea, supra ad costam nervosque

laterales setis adpressis instructa, aliter sparse setosa, subtus ad costam densius adpresse hirsuta et ad nervos laterales nervulosque setulosa, costa supra conspicua subtus prominente, nervis lateralibus utrinque fere 30 supra conspicuis subtus prominentibus, nervis transversis sat numerosis subtus prominulis, petiolo vix distincto ad 1 cm. longo supra canaliculato suffulta; stipulae deciduae, suboblongae, obtusae, 1–1·3 cm. longae, dorso adpresse hirsutae. *Cymae* paniculam terminalem pedunculo communi ad 1·5 cm. longo incluso ad 8 cm. longam 10 cm. latam formantes, rhachi et pedunculis subadpresse hirsutis; flores sessiles, approximati, albi, mox lutescentes (ex *Kerr*). *Receptaculum* 1 mm. longum, pilis albis rigidis subadpressis instructum. *Calycis* tubus brevis, lobi 4, lanceolati, subacuti, receptaculo subaequilongi vel eo paululo longiores, sicco receptaculo pallidiores, pilis similibus dorso instructi, ciliati. *Corollae* tubus 6·5 mm. longus, basi 1·5 mm. diametro, superne gradatim ampliatus, apice 3 mm. diametro, extra pallide pubescens, intra 1–1·5 mm. supra basem pilis rigidis horizontalibus annulatim dispositis instructus, aliter glaber, lobi quattuor, 2·5 mm. longi, 2 mm. lati, dorso breviter sparse pubescentes, intra densius subpilosi. *Stamina* 4, filamentis 0·5 mm. longis, 5 mm. supra corollae tubi basem affixis; antherae e tubo paululo exsertae, breviter acuminatae, 2·25 mm. longae, loculis basi inter se liberis. *Stylus* ante anthesin exsertus, 1 cm. longus, glaber, stigmatibus duobus recurvis.

Satul, Ban Ton, 50 m., light evergreen by stream, *Kerr* 14424.

Argostemma condensum *Craib* [Rubiaceae-Hedyotideae]; ab affini *A. parvifolio* Benn. foliis minoribus, pedicellis et receptaculis glabris, haud pilosis, recedens.

Herba caule 6–8 cm. longo nodis inferioribus radicante glabro sicco angulato subviridi albo-maculato. *Folia* approximata, iuniora sicco imbricata, opposita, paribus inter se valde inaequalibus, oblanceolata, lanceolata, vel anguste suboblonga, apice acuta, saepe apiculata, basi cuneata, maiore 6–11 mm. longo 2·5–3·5 mm. lato, minore saepissime 4 mm. longo et 1 mm. lato, sicco subviridia, chartacea, pagina superiore ad costam setis 1–2 primo instructa, aliter glabra, setis demum deciduis, costa supra prominente subtus conspicua, nervis lateralibus utrinque 5–6 subtus in foliis iunioribus subconspicuis, nervulis obscuris, margine apicem versus setoso-subdenticulata, petiolo brevi suffulta vel subsessilia; stipulae foliaceae, persistentes, saepissime ovatae, apice subulatae, circa 3 mm. longae. *Flores* albi (ex *Kerr*), solitarii, terminales, pedicello 7–13 mm. longo glabro pauci-bracteolato suffulti. *Receptaculum* circa 1 mm. longum, glabrum, albo-lineolatum. *Calyx* glaber, sicco viridis, fere ad basem 5-fidus, segmentis lanceolatis longius acute attenuatis fere 2 mm. longis et basi vix 1 mm. latis. *Corollae* tubus 1·5 mm. longus, lobi 7 mm. longi, 2·5 mm. lati. *Stamina* circa 7 mm. longa, antheris apice attenuatis inter se in columnam coalitis. *Stylus* stamina paululo superans.

Satul, Klawng Ton, 200 m., rock by stream in evergreen forest, *Kerr* 14440.

Argostemma dispar *Craib* [Rubiaceae-Hedyotideae]: ab affini *A. involucrato* Hemsl. calyce quam corolla conspicue, haud parum breviore recedit.

Caules annui, inferne defoliati, nodis inferioribus radicantes, 15–30 cm. longi, simplices vel interdum ramosi, pilis elongatis divaricatis sat copiose primo induti, sicco sulcati. *Folia* opposita inter se valde inaequalia, maiore inaequilaterali latere altero dimidiatim oblanceolato basi attenuato vel acuminato altero dimidiatim obovato basi late cuneato apice subacute acuminato vel interdum subacuto 3–6·5 cm. longo 1·3–2·8 cm. lato chartaceo sicco supra fusco-viridi subtus pallide viridi supra ad costam et marginem versus pilis elongatis instructo aliter saepissime fere glabro subtus ad costam nervosque laterales pilis similibus instructo costa supra conspicua subtus prominente nervis lateralibus utrinque 7–9 supra obscuris vel subprominulis subtus conspicuis margine conspicue ciliato apicem versus subdenticulato petiolo 3–5 mm. longo suffulto, minore ovato vel subelliptico circa 4–8 mm. longo et 3·5–6·5 mm. lato; stipulae foliaceae, diu persistentes, foliis minoribus subsimiles sed paululo minores. *Inflorescentia* terminalis, pedunculo communi 4–8 mm. supra basem bracteis stipulis similibus verticillatis instructo et in pedunculum simplicem 8–18 mm. longum flores tres umbellatim gerentem vel rarissime uniflorum vel interdum ibi furcato pedunculis lateralibus partialibus unifloris, pedunculis partialibus apice bracteis foliaceis 3–4 mm. longis verticillatis instructis, pedicellis 10–12 mm. longis, et pedunculis et pedicellis villosis; flores albi (ex *Kerr*). *Receptaculum* villosum, vix 2 mm. longum. *Calycis* tubus circa 1 mm. longus, lobi 5, ovato-lanceolati, acuti, 3·5 mm. longi, 2·25 mm. lati, dorso parce pilosi, longius ciliati. *Corollae* tubus 2·5 mm. longus, lobi 5, oblongo-lanceolati, acuti, 10 mm. longi, 4 mm. lati, dorso pilis sparsis elongatis instructi, longius ciliati. *Filamenta* corollae tubo subaequilonga, antheris inter se cohaerentibus 9 mm. longis. *Stylus* 11 mm. longus, stigmate parvo ambitu suboblongo.

Krabi, Panom Bencha, 1300 m., evergreen forest, *Kerr* 18720.

Argostemma fuscum *Craib* [Rubiaceae-Hedyotideae]; ab *A. spinuloso* C. B. Clarke inflorescentia haud glabra, ab *A. stipulaceo* Ridl., cui probabiliter maxime affine, foliis apicem versus angustatis recedit.

Herba caule inferne radicante ad 25 cm. longo iuventute sicco fusco sulcato crispatim piloso vel subhirsuto. *Folia* opposita inter se valde inaequalia, maiora saepe parum inaequilateralia, oblanceolata vel oblongo-oblanceolata, apicem versus angustata vel acuminata, summo apice breviter acute acuminata, basi inaequialta, latere altero dimidiatim cordatula vel rotundata, altero dimidiatim cordatula vel cuneata, usque ad 14 cm. longa et 4·5 cm. lata, sicco

fuscescentia, subtus pallidiora, pagina superiore setis paucis praesertim marginem versus instructa, inferiore ad costam nervosque laterales subadpresse hirsuta vel fere setulosa, ad nervulos pilis brevibus sparsius instructa, nervis lateralibus utrinque 12–15 supra conspicuis subtus prominulis, nervulis subtus subprominulis, margine ciliata, petiolo 1–2 cm. longo indumento ei caulis simili tecto suffulta, minora stipuliformia, saepe decidua ; stipulae foliacea, diu persistentes, 10–12 mm. longae, 4–6 mm. latae. *Cymae* terminales, pedunculo communi 5 cm. longo incluso 8 cm. longae, pedunculis partialibus 3–5, inferioribus fere 1·5 cm. longis trifloris, superioribus brevioribus unifloris, pedicellis circa 5 mm. longis, bracteis angustis circa 3 mm. longis, pedunculis cum rhachi et pedicellis breviter subsparsius crispatim pilosis ; flores albi (ex *Kerr*). *Receptaculum* 1 mm. longum, cum calyce sparse crispatim pubescens, sicco fuscum. *Calyx* circa 1·25 mm. longus, ad medium 5-lobatus, lobis deltoideis basi 1 mm. latis ciliatis. *Corollae* tubus 2 mm. longus, lobi 5, ovato-lanceolati, superne angustati, apice acuti, 6·5 mm. longi, 3 mm. lati, intra glabri, dorso puberuli. *Filamenta* 0·5 mm. longa, glabra ; antherae inter se cohaerentes, apice attenuatae, 7·5 mm. longae. *Stylus* ex antherarum columna brevissime exsertus.

Nakawn Sritamarat, Kao Luang, 400 m., evergreen forest, *Kerr* 15413.

Argostemma lobulatum *Craib* [Rubiaceae-Hedyotideae] ; ab *A. acuminato* King foliis maioribus, nervis lateralibus magis numerosis, floribus maioribus inter alia recedit.

Herba erecta, caule ad 25 cm. alto glabro sicco fusco sulcato squamarum oppositarum paribus 1–3 instructo. *Folia* ad caulis apicem per 5–7 verticillata, plus minusve lanceolata, oblanceolata, vel oblongo-lanceolata, acuminata, basi cuneata, saepe inaequilateralia, 7–20 cm. longa, 2–4·5 cm. lata, membranacea, sicco supra fusca, subtus saepissime fusco-viridia, supra pilis brevibus hic et illic instructa, subtus pilis similibus ad nervos nervulosque marginem prope sparse instructa vel fere glabra, nervis lateralibus utrinque 15–30 pagina utraque conspicuis intra marginem anastomosantibus, nervulis rete laxum efficientibus, sessilia vel subsessilia ; stipulae parvae, oblongae. *Pedunculi* terminales, solitarii, rarissime gemini, 1–3·5 cm. longi, puberuli, apice bracteati, cymas umbelliformes vel corymbiformes gerentes, pedunculis partialibus brevibus vel ad 12 mm. longis, pedicellis ad 1 cm. longis breviter pubescentibus ; flores albi, medio subrubri (ex *Kerr*). *Receptaculum* breviter pubescens, circa 1·5 mm. longum. *Calycis* tubus 1·25 mm. longus, lobi 5, subovati, acuti, apice dorso indurati, circa 2·5 mm. longi et 2·25 mm. lati, dorso puberuli, intra glabri, ciliolati. *Corollae* tubus 3·5 mm. longus, lobi 5, deltoidei, acuti, 3·5 mm. longi, basi 3 mm. lati, nervosi. *Filamenta* 1·25 mm. longa, antheris 2 mm. longis obtusis inter se cohaerentibus. *Stylus* 5 mm. longus, glaber, stigmate parvo bilobulato.

Prachuap, Kao Luang, 1000 m., rocks in evergreen forest, *Kerr* 10822.

Argostemma saxicolum *Craib* [Rubiaceae-Hedyotideae]; ab affini *A. Lobbii* Hook. f. floribus minoribus, corollae lobis conspicue minoribus recedit.

Herba, ut videtur, annua; caulis gracilis, 4·5–8 cm. longus, glaber, angulatus. *Folia* opposita, lineari-lanceolata vel lanceolata, obtusa, basi cuneata, paribus inter se inaequalibus, altero 1·2 cm. longo 2·5-4 mm. lato petiolo usque ad 3 mm. longo suffulto, altero ad 8 mm. longo brevius petiolato, membranacea, supra viridia, subtus pallide viridia, pagina superiore marginem versus et inferiore ad costam setulis paucis brevibus praetereaque inferiore pilis paucis brevibus adpressis inconspicuis primo instructa, nervis lateralibus tenuibus obscuris utrinque circa 10; stipulae persistentes, foliis minoribus fere omnino similes. *Flores* albi (ex *Put*), terminales, solitarii, pedicello glabro ad 1 cm. longo suffulti et ex axillis superioribus in cymam trifloram pedunculo communi glabro ad 1 cm. longo apice folia duo et stipulas iis caulium similes sed minores gerente dispositi, rarius solitarii, orti. *Receptaculum* glabrum, sicco fuscum, 0·75 mm. longum. *Calycis* tubus 0·5 mm. longus, lobi late deltoidei, obtusi, tubo paululo longiores, circa 1 mm. lati. *Corollae* tubus circa 0·5 mm. longus, lobi 5, oblongo-lanceolati, subacuti, 2·5 mm. longi, 1·5 mm. lati. *Stamina* inter se libera, filamentis usque ad 1·5 mm. longis, antheris 2 mm. longis. *Stylus* 3 mm. longus, stigmate parvo capitato.

Kanburi, Baw Re, among rocks, *Put* 217.

Argostemma septatum *Craib* [Rubiaceae-Hedyotideae]; ab *A. involucrato* Hemsl. calycis lobis conspicue brevioribus, ab *A. dispare* Craib foliis pro longitudine angustioribus nervis lateralibus magis approximatis et numerosis inter alia recedit.

Caules annui, 15–24 cm. longi, pilis elongatis divergentibus albis transverse septatis sat copiose instructi. *Folia* opposita inter se valde inaequalia; maiora inaequilateralia, latere altero dimidiatim oblanceolata, basi rotundata, altero oblanceolata vel oblongo-oblanceolata, basi cuneata, apice acute acuminata, 5·5–7·5 cm. longa, 1·7–2 cm. lata, tenuiter chartacea, sicco supra viridia, subtus pallida, pagina superiore pilis elongatis albis transverse septatis inter se sat distantibus sed ad costam magis approximatis, inferiore pilis similibus ad costam nervosque laterales aliter sparsis instructa, costa supra conspicua subtus prominente, nervis lateralibus utrinque 11–14 rectis pagina utraque conspicuis, nervis transversis obscuris, longius ciliata, apicem versus subdenticulata, petiolo ad 7 mm. longo piloso suffulta; minora saepissime ovata, circa 7 mm. longa; stipulae diu persistentes, foliaceae, foliis minoribus similes sed paululo minores. *Cymae* terminales, 2–3-florae, pedunculo communi 2–2·5 cm. longo saepe paulo supra medium bracteis circa 3 mm. longis instructo apice bracteis similibus instructo suffultae, pedicellis ad 1·5 cm. longis cum pedunculo pilosis; flores albi (ex *Kerr*).

Receptaculum pilosum, 1·25 mm. longum. *Calycis* tubus 1·5 mm. longus, lobi 5, subovati, acuti, paululo ultra 2 mm. longi, 2–2·25 mm. lati, dorso pilis paucis elongatis instructi vel glabri, longius ciliati. *Corollae* tubus 3 mm. longus, lobi 5, ovato-lanceolati, acuti, 10 mm. longi, 5 mm. lati, longe ciliati, aliter glabri. *Filamenta* 3·5 mm. longa; antherae inter se cohaerentes, 9 mm. longae. *Stylus* 11·5 mm. longus, glaber, stigmate parvo.

Trang, Kao Sung, 1100 m., evergreen forest, *Kerr* 15261.

Clarkella siamensis *Craib* [Rubiaceae-Hedyotideae]; a *C. nana* (Edgew.) Hook. f. partibus omnibus maioribus distinguenda.

Herba saxicola, 4·5–12 cm. alta, caule erecto sicco fusco puberulo folium basale solitarium et superne folia 4–6 gerente. *Folia* basalia ima basi vel paulo supra basem caulis orta, oblongo-ovata, ovata, vel elliptico-ovata, apice subacuta, basi truncata vel inaequaliter cordata, saepissime 5-7 cm. longa et 2·7–4·5 cm. lata, membranacea, sicco supra viridia, subtus subplumbea, pagina utraque puberula vel superiore subglabra, nervis lateralibus utrinque 6–8 pagina utraque conspicuis, ciliolata, petiolo 2–4·7 cm. longo puberulo sicco fusco suffulta; folia caulinaria opposita, basali subsimilia nisi saepissime multo minora; stipulae parvae, lineari-lanceolatae deltoideaeve integrae, pallide apiculatae. *Cymae* terminales, solitariae, e floribus circa 7 constitutae, pedunculo communi circa 1·5 mm. longo glabro suffultae; bracteae flabelliformes, 1·5 mm. longae, apice fimbriis paucis brevibus rigidis pallidis instructae, aliter fuscae, puberulae; pedicelli vix a receptaculo distinguendi, 3 mm. longi, apice puberuli, aliter glabri. *Receptaculum* circa 2 mm. longum, puberulum, inferne in pedicellum angustatum. *Calycis* tubus brevis, lobi 5, inter se inaequales et variabiles, interdum uno interdum duobus aliis conspicue longioribus lanceolatis subacutis 2·5–3·5 mm. longis 1·25–1·5 mm. latis pagina utraque puberulis ciliolatis, minoribus circa 1·25 mm. longis aliter maioribus similibus. *Corolla* in alabastro claviformis, extra conspicue longius puberula; tubus 1 cm. longus, inferne paululo ultra 1 mm. diametro, intra glaber; lobi valvati, ad 5 mm. longi et 2·75 mm. lati. *Stamina* 5, filamentis brevibus glabris circa 1 mm. supra corollae tubi basem affixis, antheris linearibus circa 1·8 mm. longis. *Styli* duo, fere e basi liberi, 2 mm. longi, graciles; ovarium biloculare, ovulis numerosis. *Fructus* indehiscens, calyce persistente coronatus, seminibus numerosis parvis fuscis pallide lineolatis varie angulatis interdum subalatis.

Tung Song, Kao Chem, on rock, *Rabil* 139.

Hedyotis betongensis *Geddes* [Rubiaceae-Hedyotideae]; ab affini *H. Havilandii* King indumento densiore, corolla quam calyce conspicue longiore, filamentis brevibus, capsula magis globosa, inter alia recedens.

Herba ramulis pubescentibus angulatis mox duriusculis ad 2·5 mm. diametro. *Folia* saepissime ovato-lanceolata, apice acuta, basi cuneata vel acuminato-cuneata, 2·5–5 cm. longa, 1·2–2·2 cm.

lata, chartacea, sicco viridia, subtus pallidiora, pagina utraque scabridula, costa supra conspicua subtus prominente, nervis lateralibus utrinque 4–5 sat obliquis supra plus minusve conspicuis subtus subprominulis, nervulis obscuris, margine scabridula, petiolo 4–8 mm. longo pubescente suffulta ; stipulae persistentes, 3–5 mm. longae, lanceolatae vel late lanceolatae, pinnatim lobatae, lobis angustis apice glandulosis, hirsutae. *Cymae* axillares, glomerulatae, pedicellis ad 0·5 mm. longis parce pubescentibus, bracteis angustis quam pedicellis brevioribus. *Receptaculum* vix 1 mm. longum, hirsutum. *Calyx* fere ad basem 4-fidus, segmentis lineari-lanceolatis 1 mm. longis dorso hirsutis. *Corolla* alba (ex *Kerr*), dorso apicem versus pilis paucis rigidis instructa ; tubus 2 mm. longus, intra apicem versus paucipilosus ; lobi 4, deltoidei, subobtusi, 0·75 mm. longi. *Filamenta* brevia, fere ad corollae tubi apicem inserta, antheris circa 0·5 mm. longis. *Stylus*, stigmatibus inclusis, 2·75 mm. longus. *Capsula* crustacea, vix 2 mm. longa, septicide et deinde loculicide dehiscens ; semina numerosa, parva, fusco-brunnea, triangulata.

Betong, 600 m., evergreen forest, *Kerr* 7651.

Hedyotis corymbiformis *Geddes* [Rubiaceae-Hedyotideae] ; ab affini *H. contracta* (Pierre ex Pitard) stipulis pinnatim lobatis, receptaculo puberulo, calycis segmentis brevioribus recedit.

Frutex circa 3 m. altus (ex *Kerr*) ; ramuli primo angulati, puberuli, sublutei, mox obtuse angulati, glabri, saepissime brunnei vel rubro-brunnei, circa 4 mm. diametro. *Folia* lanceolata vel late lanceolata, apice attenuata vel subacuminata, acuta, basi cuneata, saepe parum inaequilateralia, 7–12 cm. longa, 1·2–2·8 cm. lata, sicco plus minusve lutescentia, rigide chartacea, costa supra impressa subtus prominente, nervis lateralibus utrinque 7–8 sat obliquis intra marginem anastomosantibus pagina utraque prominulis, margine parum recurva, petiolo ad 5 mm. longo supra canaliculato lamina decurrente saepissime subalato suffulta ; stipulae persistentes, circa 7 mm. longae, dorso inferne puberulae, marginem versus incrassatae, ibi et superne breviter pubescentes. *Paniculae* terminales, corymbiformes, ad 5 cm. longae et 9 cm. diametro, et rhachi et ramulis puberulis ; flores subsessiles. *Receptaculum* breve, puberulum. *Calycis* segmenta 4, deltoidea, inter se inaequalia, circa 0·5 mm. longa. *Corollae* dorso puberulae tubus 1·75 mm. longus, lobi 4, apice inflexi, 2·25 mm. longi, intra basi villosi. *Stamina* 4, filamentis fere ad corollae tubi apicem insertis 1·5 mm. longis, antheris 0·75 mm. longis. *Stylus*, stigmate bilamellato incluso, circa 2 mm. longus, medio ampliatus. *Fructus* fere maturus anguste pyriformis, puberulus, seminibus loculo quoque pluribus.

Chantabun, Tamun, 200 m., edge of evergreen forest, *Kerr* 9707.

Hedyotis cytisoides *Craib* [Rubiaceae-Hedyotideae] ; ab affini *H. praecoce* (Pierre ex Pitard) caule altiore nisi iuventute glabro, calycis segmentis et fructu maioribus recedit.

Caules e radice lignosa plures, erecti, 45–70 cm. alti, simplices vel pauci-ramosi, iuventute inconspicue puberulo-scaberuli, mox glabri, conspicue angulati, inferne ad 3·5 mm. diametro, sicco virides, inferne plus minusve brunnescentes. *Folia* opposita, linearia, apice subacuta, ad 5 cm. longa et 2 mm. lata, sat rigida, glabra vel subglabra, costa supra impressa subtus prominente, nervis lateralibus omnino obscuris, margine revoluta, sessilia; stipulae virides, saepissime lineares, saepe pauci-denticulatae vel pauci-lobulatae, circa 7 mm. longae, mox deciduae. *Cymae* paniculam terminalem ad 25 cm. longam et 20 cm. diametro efficientes, singulis pedunculo communi circa 1·5 cm. longo incluso ad 6 cm. longis, pedunculis glabris vel inconspicue puberulis; pedicelli ad 0·5 mm. longi; bracteae pedicellis duplo longiores vel iis subaequilongae; flores albi (ex *Kerr*). *Receptaculum* 0·5 mm. longum, puberulum. *Calycis* segmenta 4, lanceolata, acuta, dorso medio carinata, 1·5 mm. longa, viridia. *Corollae* tubus 2 mm. longus, intra pilosus, lobi oblongo-lanceolati, 1·5 mm. longi. *Stamina* 4, filamentis circa 0·5 mm. longis ad corollae tubi apicem insertis, antheris oblongis circa 0·75 mm. longis. *Stylus* gracilis, 1 mm. longus, glaber, stigmatibus duobus 1·25 mm. longis. *Fructus* puberulus, circa 2 mm. diametro, septicide dein loculicide dehiscens.

Korat, Chan Tuk, 100 m., open grassy forest, *Kerr* 8046.

Hedyotis Dawsoniana *Craib* [Rubiaceae-Hedyotideae]; species *H. fulvae* Hook. f. habitu persimilis sed haud villosa.

Caules e radice lignosa orti, annui, erecti, saltem 35 cm. alti, quadrangulares, primo interdum bifacialiter parce pilosi, mox glabri, sicco virides, duri, ad 2·5 mm. diametro. *Folia* lanceolata angusteve lanceolata, apice acuta, basem versus angustata, obtusa, rotundata, vel subcordata, 3–4 cm. longa, 0·5–1 cm. lata, rigida, sicco viridia vel parum lutescentia, subtus pallidiora, supra pilis brevibus rigidis scabridula, subtus ad costam nervosque laterales pilis similibus sparse instructa, nervis lateralibus utrinque 3–4 obliquis cum costa supra impressis subtus prominentibus, nervulis obscuris, margine recurva, sessilia vel subsessilia; stipulae membranaceae, lobis tribus subulatis quorum mediano circa 4·5 mm. longo lateralibus 2 mm. longis et paucis aliis parvis glanduliformibus instructae, primo parce pilosae. *Pedunculi* axillares, cymas glomerulatas gerentes, inflorescentia tota 2 cm. longa, pedunculis puberulis, floribus albis (ex *Kerr*). *Receptaculum* breve, puberulum. *Calyx* ultra medium in lobos 5 sublanceolatos circa 1 mm. longos divisus. *Corollae* tubus 1·25 mm. longus, apice villosus, lobi 5, lanceolati, circa 1·5 mm. longi et 0·8 mm. lati. *Stamina* 5, filamentis brevibus ad corollae tubi apicem insertis, antheris vix 0·5 mm. longis. *Stylus*, stigmate bilobato incluso, 2·5 mm. longus; ovarium biloculare, ovulis loculo quoque pluribus.

Lôi, Kao Krading, 1200 m., open grassy ground, *Kerr* 8675.

Hedyotis decora *Geddes* [Rubiaceae-Hedyotideae] ; quoad calycis lobos inter *H. Maingayi* Hook. f. et *H. elegantem* Wall. posita, ab illa lobis brevioribus ab hac lobis longioribus recedit.

Herba circa 0·5 m. alta (ex *Kerr*) ; ramuli herbacei, virides vel interdum brunnei, primo albo-maculati, glabri, bisulcati. *Folia* lanceolata vel late lanceolata, rarius oblongo-lanceolata, apice angustata acuminatave, summo apice subacuta, basi cuneata vel rarius rotundata, 4·5–8 cm. longa, 1·5–2·2 cm. lata, sicco rigide chartacea, pagina utraque viridia, inferiore parum pallidiora vel utraque plus minusve brunnescentia, matura glabra, nervis lateralibus utrinque circa 5 obscuris inferioribus sat obliquis superioribus magis patulis intra marginem anastomosantibus, margine revoluta, petiolo 1–6 mm. longo supra canaliculato suffulta ; stipulae circa 2 mm. longae, late deltoideae, interdum apice obtuse acuminatae et margine breviter obtuse glanduloso-fimbriatae, plus minusve pubescentes, diu persistentes. *Cymae* in paniculam terminalem foliatam circa 10 cm. longam dispositae, ramulis inferioribus ad 3 cm. longis paniculam 2·5 cm. longam et 3·5 cm. diametro gerentibus superioribus gradatim brevioribus, glabrae ; bracteae lineares, persistentes. *Receptaculum* 1 mm. longum, glabrum. *Calycis* tubus brevis, lobi 4, late lanceolati, sub anthesin paulo ultra 1 mm. longi, dorso medio carinati. *Corolla* alba (ex *Kerr*) ; tubus 2·5 mm. longus, extra glaber, intra superne pilosus ; lobi quattuor, 2 mm. longi, intra basi pilosi. *Stamina* 4, filamentis 0·75 mm. longis ad corollae tubi apicem affixis, antheris circa 1·3 mm. longis. *Stylus* 1·75 mm. longus, stigmatibus duobus 0·75 mm. longis ; ovarium biloculare, ovulis numerosis. *Capsula* calyce persistente coronata.

Nakawn Sritamarat, Kao Luang, 1300–1700 m., very common in evergreen forest, *Kerr* 15497.

Hedyotis densa *Craib* [Rubiaceae-Hedyotideae] ; ab *H. congesta* R. Br. ex G. Don foliis angustioribus magis conspicue nervosis, floribus magis numerosis et congestis, calycis segmentis longioribus angustioribus inter alia recedit.

Caules annui, e radice lignosa orti, ad 40 cm. alti, simplices vel parce ramosi, iuventute conspicue 4-angulati, fere subalati, sicco brunnei, mox conspicue angulati, brunnei vel olivacei, glabri. *Folia* lanceolata, superne angustata vel subacuminata, summo apice subacuta, basi cuneata, ad 7 cm. longa et 1·7 cm. lata, subcoriacea, sicca plus minusve lutescentia, glabra, costa supra impressa subtus prominente, nervis lateralibus utrinque 4–6 obliquis supra argute impressis subtus prominentibus, nervulis obscuris, margine recurva, petiolo 5–8 mm. longo glabro supra canaliculato suffulta ; stipulae ad 7 mm. longae, pinnatim lobatae, marginem et apicem versus parce pilosae, marginem versus incrassatae, mox deciduae. *Glomeruli* axillares, densi, petiolo subaequilongi ; flores albi (ex *Kerr*) ; bracteae parvae, glanduloso-fimbriatae ; pedicelli circa 0·5 mm. longi, glabri. *Receptaculum* 1 mm. longum, viride, superne pilis paucis instructum. *Calycis* tubus 0·5 mm. longus, lobi 4, lanceolati, subacuti, 2·75 mm.

longi, circa 1 mm. lati, parum recurvi, dorso pilis albis rigidis instructi, intra glabri et latere utroque basi glandula brevi filamentosa brunnea instructi, ciliati. *Corollae* tubus 2·5 mm. longus, intra superne villosus, lobi 4, deltoidei, obtusi, 1·75 mm. longi, 1·25 mm. lati, dorso breviter hirsuti, intra puberuli, ciliolati. *Stamina* 4, filamentis 1 mm. longis brunneis glabris ad corollae tubi apicem insertis, antheris medifixis filamentis subaequilongis. *Stylus* vix 3 mm. longus. *Fructus* 2·5 mm. longus, 1·25 mm. diametro, septicide dein loculicide dehiscens, calyce persistente coronatus; semina loculo quoque circa 6, triangulata, foveolata, brunnea.

Ranawng, Kao Pawta Luang Keo, 1300 m., open ground on ridge, *Kerr* 16952.

Hedyotis diversifolia *Geddes* [Rubiaceae-Hedyotideae]; *H. patenti* Ridl. habitu similis sed inflorescentia magis robusta, pedicellis brevioribus inter alia recedit.

Herba circa 50 cm. alta; caulis pro longitudine saepissime sat robustus, ad 5 mm. diametro, glaber, primo angulatus, mox subteres, sicco pallide viridis vel purpurascens. *Folia* inferiora oblongo-lanceolata, apice acuminata, subacuta, basi cuneata rotundatave, 10–14 cm. longa, 2·5–4·5 cm. lata, superiora saepissime ovata, basi cordatula, ad 10·5 cm. longa et 5·5 cm. lata, rigide chartacea, sicco supra luteo-viridia, subtus pallide viridia, glabra, costa supra conspicua subtus prominente, nervis lateralibus utrinque circa 9 supra conspicuis vel prominulis subtus prominulis, nervulis paucis subtus subprominulis, margine recurva, petiolo 3–4 mm. longo supra canaliculato suffulta, vel superiora fere sessilia; stipulae persistentes, oblato-triangulares, marginem versus incrassatae. *Panicula* terminalis, ad 10 cm. longa, ramis patentibus inferioribus ad 7 cm. longis supremis circa 1·5 cm. longis, pedicellis circa 1·5 mm. longis, partibus omnibus glabra, ramulis ultimis interdum sicco purpurascentibus; bracteae angustae, plus minusve persistentes; flores purpurei (ex *Kerr*). *Receptaculum* breve. *Calycis* segmenta 4, circa 1 mm. longa et lata. *Corollae* tubus circa 1·5 mm. longus, lobi 4, lineares, 4 mm. longi, 1·25 mm. lati, intra pilosi. *Stamina* 4, filamentis vix 0·5 mm. longis, antheris 1·5 mm. longis. *Stylus* 4·5 mm. longus; stigmata duo, complanata, 1 mm. longa. *Fructus* subglobosus, circa 2·25 mm. longus et 2 mm. diametro, septicide dein loculicide dehiscens; semina loculo quoque plura.

Krat, Baw Rai, 200 m., by stream in evergreen forest, *Kerr* 9464.

Hedyotis Garrettii *Craib* [Rubiaceae-Hedyotideae]; ab *H. punicea* Craib et *H. Wallichii* Kurz corollae tubo intra glabro recedit.

Herba annua, caule erecto gracili simplice vel apice tantum ramoso 8–17 cm. alto quadrangulare sicco parum lutescente pilis longiusculis divaricatis sparse instructo. *Folia* opposita, saepissime oblanceolata vel anguste oblanceolata, apice subacuta, basi angustata, 4–8 mm. longa, 1·5–3 mm. lata, rigide chartacea, sicca plus minusve lutescentia, pagina utraque pilis longiusculis sparse instructa,

costa supra obscura vel parum impressa subtus prominente, nervis lateralibus obscuris, margine recurva, sessilia vel petiolo brevi vix distincto suffulta. *Cymae* et caulem et saepe etiam ramulos breves ex axillis supremis ortos terminantes, sessiles, ad 4 cm. longae, pedicellis terminalibus sub fructu usque ad 8 mm. longis quam aliis conspicue longioribus; bracteae parvae. *Receptaculum* 0·75 mm. longum, puberulum. *Calycis* tubus brevis, segmenta 4, lanceolato-deltoidea, subacuta, receptaculo paululo longiora, basi 0·5 mm. lata, glabra. *Corolla* dorso glabra, tubo 1·75 mm. longo intra glabro; lobi supra albi, infra pallide violacei (ex *Garrett*), 4, subelliptici, subobtusi, circa 1·25 mm. longi et 0·8 mm. lati, glabri. *Antherae* e tubo paululo exsertae, 0·5 mm. longae. *Stylus* glaber, stigmatibus inclusis 1·75 mm. longus. *Fructus* plus minusve glabrescens, circa 2 mm. longus, septicide dein loculicide dehiscens, calyce persistente coronatus.

Doi Pa Mawn, 1570 m., wet rocks, *Garrett* 494.

Hedyotis Geddesiana *Craib* [Rubiaceae-Hedyotideae]; ab *H. lineata* Roxb. foliis minoribus, inflorescentiae indumento conspicue breviore et minus denso, calycis segmentis brevioribus recedit.

Caules e radice crassa lignosa annui, erecti, sub anthesin 8–18 cm., demum ad 60 cm. alti, primo pilosi, mox fere sparse pilosi. *Folia* saepissime ovata vel subovata, apice subacuta, breviter indurata, basi rotundata, haud rarius cordatula, 1·5–2 cm. longa, 0·7–1·2 cm. lata, rigide chartacea, sicco luteo-viridia, supra breviter hirsuta, subtus ad costam nervosque laterales patule pubescentia, aliter breviter hirsuta, costa supra conspicua vel parum impressa subtus prominente, nervis lateralibus utrinque 3–5 obliquis supra saepissime parum impressis subtus prominentibus, nervulis obscuris, margine recurva, subsessilia vel petiolo circa 1 mm. longo suffulta; stipulae diu persistentes, lobis 2–3 filiformibus deciduis instructae. *Pedunculi* axillares, plures, sub anthesin 1·2 cm. longi, apice ramosi, pedunculis partialibus circa 3 mm. longis flores sessiles gerentibus, breviter pubescentes; flores albi (ex *Kerr*), dimorphi. *Receptaculum* breve, puberulum. *Calycis* segmenta 4–5, circa 0·5 mm. longa, dorso puberula. *Corollae* tubus circa 1 mm. longus, lobi 4–5, suboblongi, 1·5 mm. longi, 1 mm. lati, intra basi villosi, margine pauperius ciliati. *Filamenta* ad corollae tubi apicem inserta, aut brevia aut 1 mm. longa; antherae parvae. *Stylus* vel 1·25 vel 3 mm. longus, medio pilis paucis divergentibus instructus.

Nakawn Panom, Ta Uten, 200 m., open grassy ground, *Kerr* 8470.

XXXIV.—MISCELLANEOUS NOTES.

The Director has been elected an Honorary Member of the California Academy of Sciences.

National Botanic Gardens of South Africa.*—The Publicity Association of Cape Town has issued an attractive illustrated Guide to the National Botanic Gardens at Kirstenbosch written by the Director, Professor R. H. Compton. A short history of the origin of the gardens with notes on their aims and functions, geology, climate, and a description of the principal features are included.

A better spot than Kirstenbosch as the site of a botanic garden could probably not have been found in the whole of South Africa. It possesses great natural scenic beauty enhanced by a wealth of indigenous forest of great botanical interest. Chief amongst the trees is the rare and almost extinct Silver Tree, *Leucadendron argenteum*, which now grows only on the Peninsula and a few isolated spots in the mountains on the other side of the Cape Flats. In Skeleton Gorge, particularly, the visitor finds himself amongst examples of trees found elsewhere only in the Knysna and Zitzikamma forests, several hundreds of miles to the east, and on the eastern slopes of the Drakensberg.

A plan of the Kirstenbosch Garden is included in the booklet, with a short description of the Public Gardens in Cape Town, Claremont and Wynberg.

Reference may also be made to the Journal of the Botanical Society of South Africa,† part xvi of which, containing a number of interesting articles, has just appeared. Amongst other papers is one by Prof. F. E. Lloyd on the structure and mechanism of the trap of *Utricularia capensis*, another by Mrs. Levyns on the Rhenoster Bush, *Elytropappus Rhinocerotis*, and another by Professor Compton, who contributes some observations on his recent visit to botanic gardens in Ceylon and Java. It is pleasing to note that the membership of the Society has now reached 1,133.

Turpentine from Pinus Merkusii.—*Pinus Merkusii* Jungh. et de Vriese, sometimes referred to as the "Tenasserim Pine," is the most tropical of all pines and is of wide distribution, occurring in various parts of the Eastern Tropics. The most extensive areas of the species are perhaps to be found in Burma, where it has been estimated to cover about twelve hundred square miles,‡ occupying low hills and spurs at elevations of five hundred to two thousand feet. It may exist as a pure stand or, as is more commonly the case, occur intermixed with broad-leaved trees.

It has long been known that the species produces a good quality resin, but it has not been exploited to any extent in the past as a

*The National Botanic Gardens of South Africa and the Public Gardens of Cape Town. Cape Peninsula Publicity Association, Cape Town, pp. 36 (1930).

†The Journal of the Botanical Society of South Africa, edited by R. H. Compton; Part xvi. 1930. Kirstenbosch, Newlands, C. P., South Africa, pp. 30, pl. iii., fig. iii.

‡Indian Forest Bull. No. 24, p. 3.

source of turpentine. This has probably been due to the inaccessibility of the forests. During the last few years, however, special interest has been taken in the production of turpentine from this species on a commercial scale in Sumatra, and towards the end of 1928 an up-to-date Government factory for the production of turpentine was established in the district of Atjeh. In tapping the "quarre" system as employed in the Landes of France has been adopted. The product from the factory was found to be of good quality and superior to former samples from Sumatra. In aroma it is stated to differ but little from the French and American product, and reports received from various users of turpentine in Holland, to whom samples were submitted, were favourable. A study of the composition and physical constants of the oil made at the Koloniaal Instituut, Amsterdam,* revealed the fact that it complied in every respect with the demands of the Dutch Pharmacopoeia for Oleum terebinthinae. A notable feature was the low refractive index compared with the French and American oils (the French oil is obtained from *P. Pinaster* Mill., and the American mainly from *P. palustris* Mill. and *P. caribaea* Morel.). This is attributed to the high percentage of α-pinene, 85–90 per cent. as against 60–70 per cent. for French and American oils. As this constituent is regarded as the one of most value in turpentine, this feature is claimed to enhance rather than diminish the value of the Sumatran oil. F. N. H.

Anemopaegma rugosum (*Schlecht.*) *Sprague*, comb. nov.—*Bignonia rugosa* Schlecht. in Linnaea, xxvi. 656 (1855); Hook. f. in Bot. Mag. t. 7124 (1890); Knuth in Fedde, Repert., Beih. xliii. 638 (1927).—The plant figured in Bot. Mag. is undoubtedly referable to the genus *Anemopaegma*, the disc and ovary being characteristic. It seems to agree in all essentials with Schlechtendal's description of *Bignonia rugosa* except that a staminode is present. Schlechtendal's mention of the occurrence of foliaceous pseudostipules, and his description of the capsule, also clearly point to *Anemopaegma*.

The species is a native of Venezuela, though it was included in the Index Kewensis with the geographical distribution "N. Granat." *i.e.* Colombia. This mistake was due to the very misleading title "Plantae Wagenerianae Columbicae" adopted by Schlechtendal for his account of Wagener's collections in northern Venezuela, the only justification for this title being the fact that Venezuela formed part of the Republic of Colombia during the third decade of the nineteenth century. All the Venezuelan species described in the above-mentioned paper appear to have been erroneously ascribed to Colombia in consequence of Schlechtendal's ill-chosen title.

T. A. S.

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*Atjeh-Turpentijin, tegenwoordige kwaliteit en niewe beoordeelingen, door Ir. W. Spoon. Berichten van de Afdeeling Handelmuseum van de Kon. Vereeniging Koloniaal Instituut, No. 57, pp. 30. (Druk J. H. Bussy, Amsterdam.)

Hypericum lanceolatum.—From the Cameroons Mountain Mr. T. D. Maitland has forwarded to Kew flowering and timber specimens of *Hypericum lanceolatum* Lam. This is widely spread in the mountains of East Africa as far south as Houtbosch in the Northern Transvaal, also in the Mascarene Islands, and was first recorded from Cameroons Mt. by Mann in 1862. It was also recently collected there by Dr. J. M. Dalziel. The species is found from about 4000 ft. to 10,000 ft. altitude. The chief point of interest in Mr. Maitland's notes is that the highest development of the species occurs at about 7000 ft., where he has observed trees 40 ft. high with a girth of 37 inches at 3 ft. from the ground. He notes that plants on the grassy slopes at higher altitudes never reach beyond a shrubby stage.

A similar range of habit is known for the East African high mountains and is recorded by Chipp (*K.B.* 1929, p. 189) in the Imatong Mountains, on the borders of Uganda, where on the top of Mt. Kineti at nearly 10,000 ft. it forms scrub, whilst in forest ravines at 8000 ft. it is a tree 40 ft. high. According to B. D. Burtt, the species grows at over 11,000 ft. on the Hamang Mountain in Tanganyika Territory, forming scattered scrub up to 3 ft. high. I collected this at Woodbush in the Northern Transvaal, where it grows as a small shrub. A figure is published in the Flora of West Tropical Africa 1 : p. 230, fig. 99. J. H.

Brittonia, a new botanical periodical.*—We have received from Dr. E. D. Merrill, Director-in-Chief of the New York Botanical Garden, the first number (Vol. 1, No. 1, Feb. 1931) of Brittonia, a new periodical to be issued by that Institution at irregular intervals as material becomes available. It is named in honour of Dr. N. L. Britton, and is "planned to cover primarily the fields of systematic botany and plant geography, although papers in other fields of botanical science are not excluded." The first number contains, besides an introductory note by Dr. Merrill, papers on Brazilian Algae by M. A. Howe and W. R. Taylor, on Pleistocene plants by A. Hollick, and "A short phytogeography of the Prairies and Great Plains of Central North America," by P. A. Rydberg.

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